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INSURANCE INDUSTRY INVESTMENT

MAPFRE Economic Research

Insurance industry investment

An analysis of the placement of insurance industry investment in selected markets

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MAPFRE Economic Research

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Summary

Introduction

The insurance industry is considered to be one of the main sources of institutional investment in the world. By exercising this function, it contributes to the consolidation of capital through a steady inflow of resources for the long-term financing of projects that promote economic growth, and also supports the stability of the financial system by providing a mechanism that reduces pro-cyclicality at times of crisis.

The insurance industry's capacity to carry out this function from its perspective as an investor can be explained by the fact that, unlike other financial entities, the insurance business model involves the need to implement liability-driven investment strategies in order to achieve an appropriate match in terms of maturity and interest rates between recognized liabilities and the investment instruments that back them up.

In this context, this report aims to offer a general overview of the risk profile of investment portfolios in a variety of developed markets (the Eurozone, the United States, the United Kingdom and Spain) and of emerging markets (Brazil and Mexico). These represent a range of markets that offer not only different levels of relative development, but also present a number of idiosyncratic features that allow for a deeper analysis.

For the purposes of this report, we have taken into account the latest information available with a view to identifying the placement of investment with a sufficient level of diversity to determine the proportions represented by the main categories of assets. In the same way, the information relating to investment in these markets is presented, whenever possible, while making a distinction between the "traditional" investment portfolio (in which investment risk is restricted thanks to an equilibrium between the different insurance companies) and that which promotes products in which it is the person taking out the insurance who assumes the investment risk (through products of the unit-linked type). It should also be noted that the analysis of the proportion between the two types of business is also a good indicator of the degree of sophistication attained by a given insurance market.

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Summary

The present report aims to offer a general overview of the risk profile of insurance companies' investment portfolios in a variety of developed and emerging markets, and also of the capital charges that are applied to the said investments in the European Union, in accordance with the types of assets.

For the purposes of this analysis, we have identified the placement of the investments with a sufficient level of diversity to be able to determine the proportions represented by the main categories of assets, so as to facilitate a comparison between them. The analysis has focused on the following markets: the Eurozone, the United States, the United Kingdom, Spain, Brazil and Mexico. As can be observed in Table S-1, these represent a group of markets that offer not only a different level of relative development, but also idiosyncratic features that allow for a deeper analysis.

Table S-1
Selected markets: investments managed by the insurance industry, 2016
(billions of euros)

Market	Investment	GDP	% of GDP
Eurozone	7,048,596	10,773,928	65.4%
United States	5,398,483	16,374,987	33.0%
United Kingdom	2,293,934	2,375,897	96.6%
Spain	286.848	1,113,851	25.8%
Brazil	201.347	1,625,346	12.4%
Mexico	49.529	946.066	5.2%

Source: MAPFRE Economic Research (with information from EIOPA, NAIC, SUSEP, CNSF and the IMF)

The information relating to investments in these markets is presented, whenever possible, while making a distinction between the "traditional" investment portfolio (in which investment risk is restricted thanks to an equilibrium between the different insurance companies) and that which promotes products in which it is the person taking out the insurance who assumes the investment risk (through products of the unit-linked type). Thus, once the traditional investment portfolio has been defined, the proportions corresponding to each category of assets are then calculated.

Table S-2
Selected markets: the structure of investment portfolios broken down by type of insurance business, 2016
(%)

Type of business	Eurozone	United Kingdom	Spain
Traditional business portfolio	84.8%	45.8%	94.5%
Unit-linked business portfolio	15.2%	54.2%	5.5%

Source: MAPFRE Economic Research (with information from EIOPA)

This method of presenting the information is based on the idea that in traditional (i.e., non unit-linked) portfolios it is appropriate to distinguish the placement of the investments made, with a view to defining the nature of the risk taken on by the insurance companies. In this sense it should be emphasized that, in the case of unit-linked investment portfolios, investment decisions do not depend exclusively on the insurance company, but are also influenced by the decisions made by the persons taking out the insurance. Moreover, this precise criterion has been followed by the

Table S-3
Selected markets: a structural breakdown of investment portfolios, 2016
(%)

Asset type	Eurozone	United States	United Kingdom	Spain
Corporate fixed income	31.5%	50.3%	35.2%	23.7%
Sovereign fixed income	32.9%	15.6%	20.5%	54.9%
Variable income	17.9%	13.1%	17.4%	5.3%
Loans	4.6%	9.7%	7.5%	0.7%
Cash and deposits	2.8%	4.0%	8.9%	8.9%
Property	1.9%	0.7%	2.4%	2.7%
Other investments	8.4%	6.6%	8.0%	3.9%

Source: MAPFRE Economic Research (with information from EIOPA and NAIC)

European Insurance and Occupational Pensions Authority (EIOPA) in its latest reports concerning financial stability, and has therefore been adopted in this report (whenever it has been possible to make this distinction).

The result of this classification (available only for European Union member states) can be seen in Table S-2, from which it can be seen that this type of distribution of investment portfolios depending on the type of insurance business is also an accurate indicator of the degree of sophistication of the insurance market concerned.

The area of study addressed by this report also includes the growth of investment portfolios during the course of this last decade. In this sense, the highest level of breakdown of the portfolios for comparative purposes has been achieved only for the markets in the Eurozone, the United States, the United Kingdom and Spain (see Table S-3).

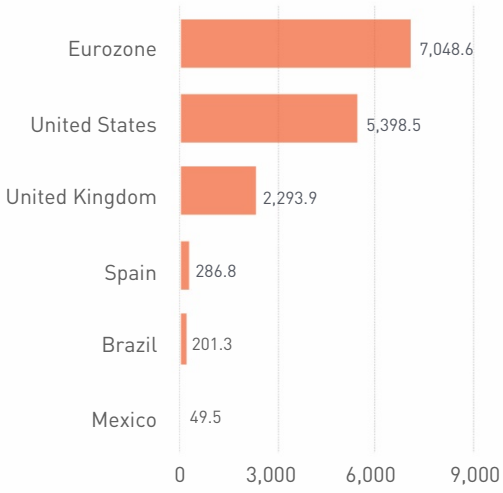
Notwithstanding the above, the third section of this report shows the comparative information available for all the markets that are the object of this analysis.

1. An analysis of the insurance markets

The analysis of this report has focused on the following insurance markets: the Eurozone (grouping together the information concerning the individual markets that comprise it), the United States, the United Kingdom, Spain, Brazil and Mexico. This group of markets has been selected for the reason not only that it offers a variety of different levels of relative development, but also for its various idiosyncratic features.

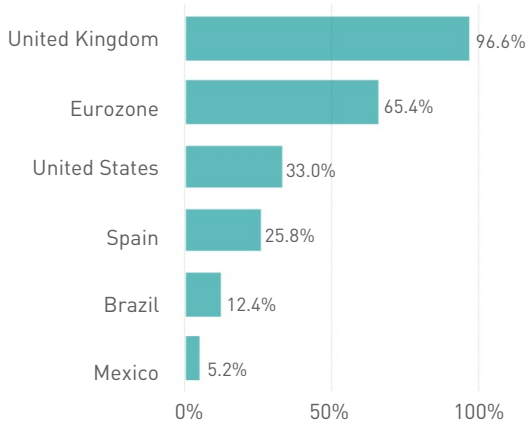
As illustrated in Chart 1-a, the insurance markets taken into account for analysis purposes represented in their totality an investment of 15,278.7 billion euros in 2016. Furthermore, when analyzed individually, the investments made during that year by the insurance industry in these countries represented significant proportions of their respective gross domestic product (GDP), ranging from a remarkable 97% in the case of the United Kingdom to just over 5% in the case of Mexico (see Chart 1-b).

Chart 1-a
Selected markets: investments managed by the insurance industry, 2016
(in billions of euros)



Source: MAPFRE Economic Research (with information from EIOPA, NAIC, SUSEP and CNSF)

Chart 1-b
Selected markets: investments managed by the insurance industry compared with GDP, 2016
(% of GDP)



Source: MAPFRE Economic Research (with information from EIOPA, NAIC, SUSEP, CNSF and the IMF)

The information that was used as a basis for the analysis was provided directly by the relevant national or regional supervisory agencies. In the case of the information concerning the Eurozone market, the United Kingdom and Spain, the source was the European Insurance and Occupational Pensions Authority (EIOPA). In the case of the United States insurance market, the information was taken from that published by the National Association of Insurance Commissioners (NAIC). In the case of Brazil, the source of the data was the Inspectorate of Private Insurance (SUSEP), and for the Mexican market, the National Commission for Insurance and Securities (CNSF).

It should be pointed out that in the case of the analysis of the Spanish insurance market, data was taken from ICEA (the Spanish Insurance Companies' and Pension Funds' Cooperative Research Agency) for the specific purpose of analyzing the evolution of the national investment portfolio. The reason for this is that the information relating to Spain provided by EIOPA between 2006 and 2008 presented mutual funds on an individualized

basis, unlike the information presented for the other major markets in the Eurozone. The criteria changed between 2009 and 2015, and the data were presented on the basis of the variable income earned, so that the evolution of the various volumes of business involved was not shown in a manner that was in any way representative.

2. The structure of investment portfolios in the selected markets

The following sections constitute a description of the evolution of investment portfolios in the insurance markets in the Eurozone, the United States, the United Kingdom, Spain, Brazil and Mexico, with regard to the latest decade for which information is available.

In the case of the markets in the Eurozone, the United Kingdom and Spain, they also show a breakdown of the evolution of investment portfolios in terms of both traditional and unit-linked business over the same decade.

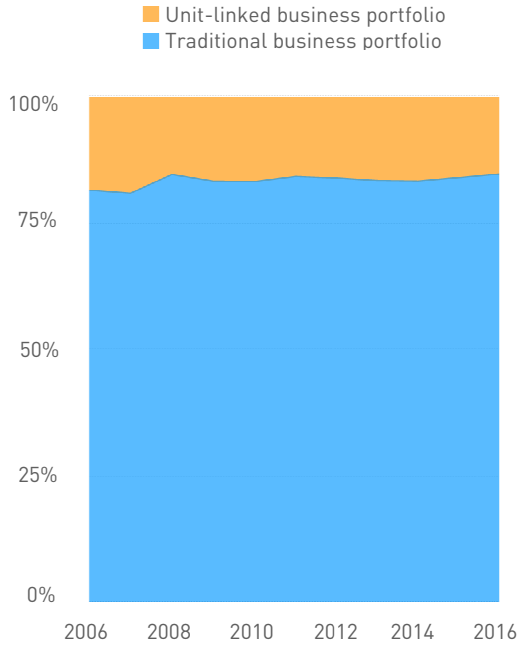
2.1 Eurozone

For the totality of the insurance markets included in the Eurozone (Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain), Table 2.1-a and Chart 2.1-a show the evolution of investment portfolios broken down by type of insurance business (i.e., distinguishing between traditional and unit-linked business) during the most recent decade for which information is available (2006-2016).

While it might have been imagined that the current low interest-rate environment could have led to an increase in the relative proportion of the type of business by which the person taking out insurance assumes a financial risk, the data in actual fact indicate that over the period 2006-2016 the share of unit-linked portfolios within the overall investment portfolio fell by 3.2 percentage points (pp), remaining at a constant level during the period following the financial crisis.

With regard to the evolution of the structure of the traditional investment portfolio broken down by asset type over the past decade, while it is true that the percentages have remained more or less stable throughout the period, a trend is observed

Chart 2.1-a
Eurozone: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Table 2.1-a
Eurozone: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)

Type of business	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Traditional business portfolio	81.6%	81.0%	84.7%	83.4%	83.3%	84.3%	84.0%	83.5%	83.4%	84.1%	84.8%
Unit-linked business portfolio	18.4%	19.0%	15.3%	16.6%	16.7%	15.7%	16.0%	16.5%	16.6%	15.9%	15.2%

Source: MAPFRE Economic Research (with information from EIOPA)

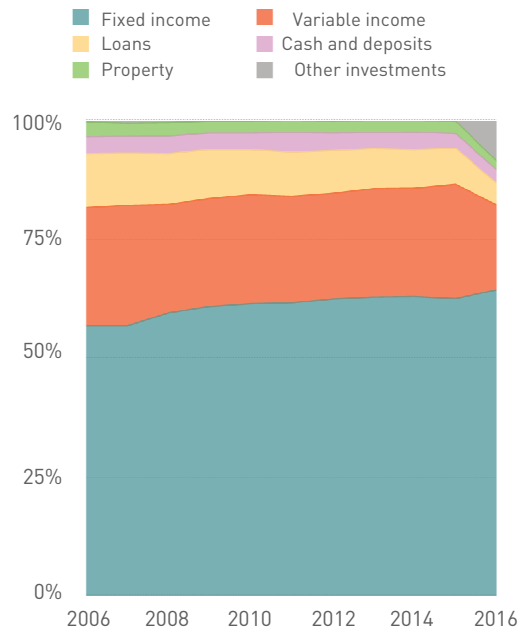
Table 2.1-b
Eurozone: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)

Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	56.9%	56.9%	59.6%	60.9%	61.5%	61.7%	62.5%	62.9%	63.0%	62.6%	64.4%
Variable income	24.8%	25.3%	22.8%	22.7%	22.9%	22.4%	22.2%	22.8%	22.8%	24.0%	17.9%
Loans	11.4%	11.0%	10.7%	10.3%	9.5%	9.3%	9.0%	8.4%	8.1%	7.6%	4.6%
Cash and deposits	3.5%	3.5%	3.7%	3.5%	3.5%	4.1%	3.7%	3.4%	3.7%	3.1%	2.8%
Property	3.1%	2.8%	2.8%	2.5%	2.5%	2.5%	2.5%	2.5%	2.4%	2.6%	1.9%
Other investments	0.2%	0.3%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%

Source: MAPFRE Economic Research (with information from EIOPA)

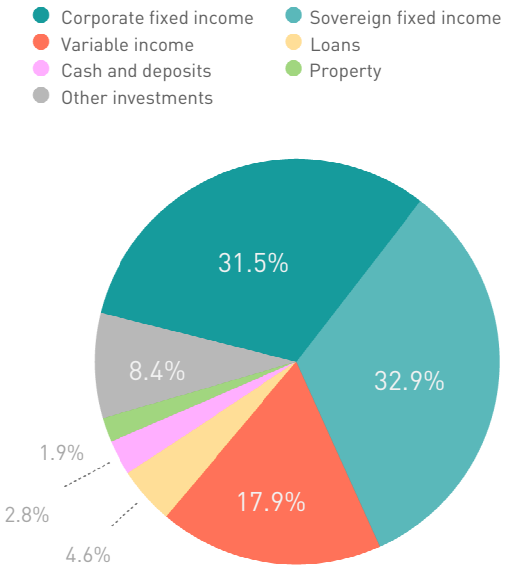
toward an increase in fixed income investment (+7.5pp), compared with a reduction in variable income investment (-6.9pp). This behavior can be partially explained in terms of an anticipation of the coming into force of the Solvency II regulatory system (in 2016) and the new capital charges linked to the different asset types, which may have led to a trend toward the reorientation of investments, reducing the percentage of variable income and increasing the percentage of investment placed in fixed income. It should also be highlighted that in 2016 the "other investments" category came to prominence, whereas it had been used only very marginally prior to then. Likewise, the slight fall in the percentage of property investment (-1.2pp) is due to the new classification system under Solvency II, which excludes property for own use (see Table 2.1b and Chart 2.1b).

Chart 2.1-b
Eurozone: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Chart 2.1-c
Eurozone: structural breakdown of traditional business investment portfolios by asset type, 2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

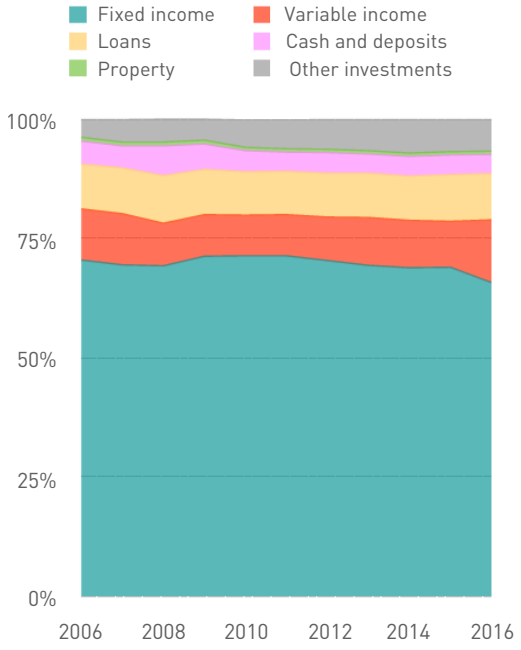
Finally, Chart 2.1-c illustrates the structural breakdown of the traditional business investment portfolio in the Eurozone by asset type. It should be noted that investments corresponding to mutual funds are presented while taking into account the placement of the investment carried out by these funds (the "look-through approach"). The information refers to the 2016 fiscal year, the most recent completed fiscal year for which data are available[1]. This information adds the details of the breakdown of the fixed income investments, specifying that 49% of the latter (or 31.5% of the total investment portfolio) represented corporate fixed income investments, while the remaining 51% (or 32.9% of the total) took the form of sovereign fixed income investments.

2.2 United States

In the case of the United States insurance market, Table 2.2 and Chart 2.2 show the evolution of the structure of the investment portfolio broken down by asset type according to the most recent decade for which information is available (2006-2016).

As can be seen from this information, and unlike the trend observed in the Eurozone insurance markets, in the case of the United States market, the proportion of fixed income investment fell during the period analyzed (-4.7pp), compensated by a growth in the relative proportion of variable income investment (+2.4pp).

Chart 2.2-a
United States: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from NAIC)

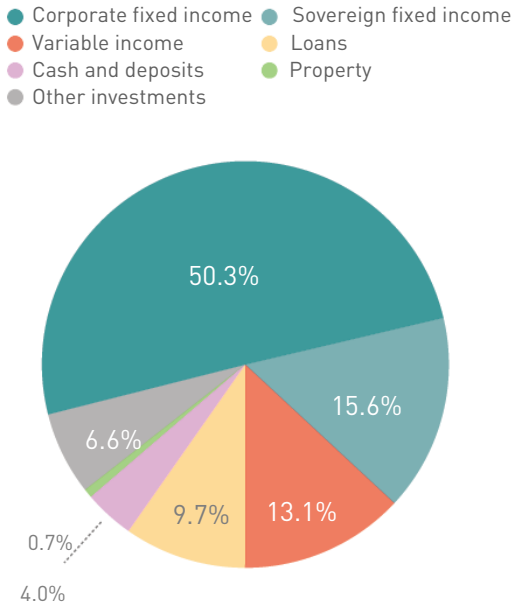
Despite this relative fall, it should be noted that, as in the Eurozone (and in general in all insurance markets), fixed income investment continues to enjoy a dominant position, inasmuch as the insurance business model presupposes a need to implement liability-driven investment strategies in order to achieve an appropriate match in terms of maturity and interest

Table 2.2
United States: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)

Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	70.6%	69.6%	69.4%	71.4%	71.5%	71.5%	70.5%	69.5%	69.0%	69.1%	65.9%
Variable income	10.7%	10.7%	8.9%	8.7%	8.5%	8.6%	9.1%	10.0%	9.9%	9.6%	13.1%
Loans	9.4%	9.6%	10.0%	9.5%	9.1%	9.1%	9.2%	9.3%	9.3%	9.8%	9.7%
Cash and deposits	4.8%	4.6%	6.2%	5.3%	4.4%	4.0%	4.3%	4.0%	4.1%	4.1%	4.0%
Property	0.8%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%	0.7%
Other investments	3.7%	4.7%	4.8%	4.4%	5.7%	6.0%	6.2%	6.5%	7.0%	6.7%	6.6%

Source: MAPFRE Economic Research (with information from NAIC)

Chart 2.2-b
United States: structural breakdown of traditional business investment portfolios by asset type, 2006
(%)



Source: MAPFRE Economic Research (with information from NAIC)

rates between recognized liabilities and the investment instruments that back them up.

Nevertheless, and unlike what is observed in the Eurozone insurance markets (and in the rest of the analyzed samples), fixed income investment is essentially concentrated in corporate fixed income.

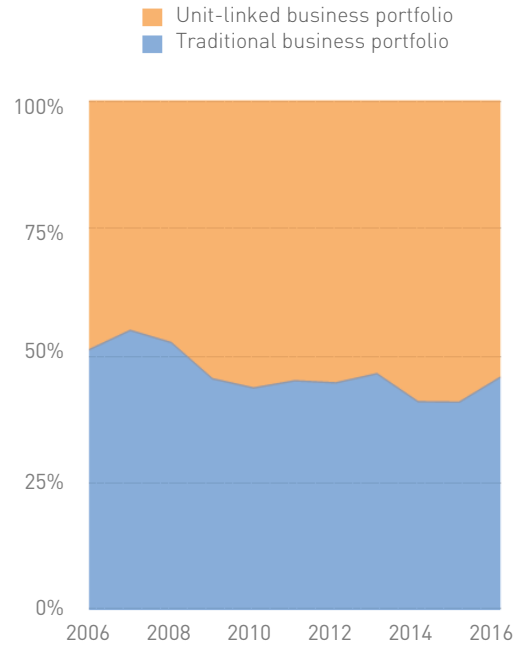
As is shown in Chart 2.2-b based on data from 2016, 76% of fixed income investment (or 50.3% of the total investment portfolio) comes under the heading of corporate fixed income, while investment in sovereign fixed income represented the remaining 24% (or 15.6% of the total portfolio).

2.3 United Kingdom

In the case of the United Kingdom insurance market, Table 2.3-a and Chart 2.3-a show the evolution of investment portfolios broken down by type of insurance business (i.e., distinguishing between traditional and unit-linked business) during the most recent decade for which information is available.

In contrast with the data for the combined Eurozone markets, in the case of the United Kingdom there is a marked tendency toward an increased proportion of unit-linked investment portfolios rather than traditional business

Chart 2.3-a
United Kingdom: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Table 2.3-a
United Kingdom: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)

Type of business	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Traditional business portfolio	51.2%	55.0%	52.6%	45.5%	43.7%	45.1%	44.7%	46.5%	41.0%	40.9%	45.8%
Unit-linked business portfolio	48.8%	45.0%	47.4%	54.5%	56.3%	54.9%	55.3%	53.5%	59.0%	59.1%	54.2%

Source: MAPFRE Economic Research (with information from EIOPA)

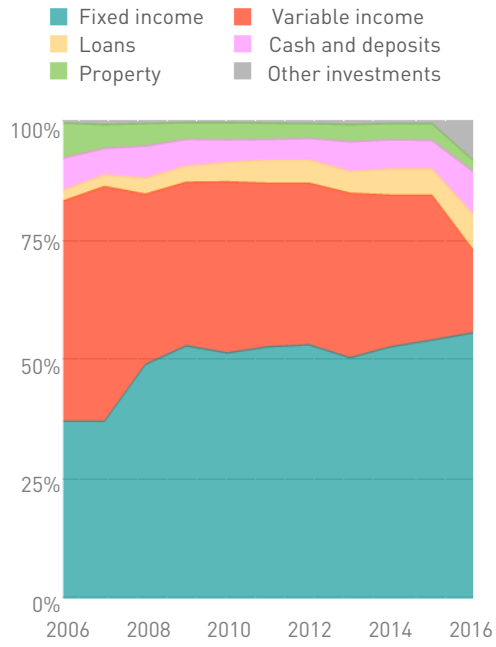
Table 2.3-b
United Kingdom: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)

Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	37.2%	37.2%	49.1%	53.0%	51.5%	52.8%	53.2%	50.5%	52.8%	54.2%	55.7%
Variable income	46.1%	49.1%	35.6%	34.2%	35.8%	34.2%	33.8%	34.4%	31.7%	30.3%	17.4%
Loans	2.3%	2.5%	3.4%	3.4%	4.1%	4.9%	4.9%	4.6%	5.5%	5.5%	7.5%
Cash and deposits	6.7%	5.5%	6.7%	5.6%	4.7%	4.3%	4.5%	6.2%	6.1%	6.0%	8.9%
Property	7.3%	5.0%	4.7%	3.5%	3.6%	3.4%	3.1%	3.6%	3.4%	3.5%	2.4%
Other investments	0.4%	0.7%	0.5%	0.3%	0.4%	0.4%	0.4%	0.7%	0.4%	0.4%	8.0%

Source: MAPFRE Economic Research (with information from EIOPA)

portfolios, which represents an idiosyncrasy of this market. Throughout the period 2006-2016, this proportion grew by 5.4pp, rising from 48.8% to 54.2%, which means not only that this market showed the highest trend toward growth in this segment, but also that it registered the highest relative proportion of such business among the markets analyzed in this report.

Chart 2.3-b
United Kingdom: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



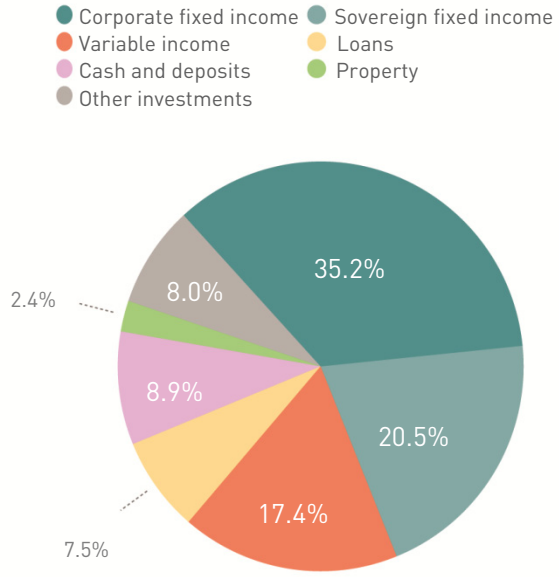
Source: MAPFRE Economic Research (with information from EIOPA)

With regard to the evolution of the structure of the traditional investment portfolio broken down by asset type in the United Kingdom during the period 2006-2016, a highly significant reorientation of investment can be seen to have taken place, with an increase in the percentage of fixed income bonds of 18.5pp and a fall in variable income of -28.7pp.

It should be noted that the largest part of the reorientation toward fixed income took place between 2006 and 2009, with an increase of 15.8pp, while the reduction in the proportion of variable income investment first took place between 2006 and 2008 (-10.5pp), and then again between 2015 and 2016 (12.9pp), coinciding with the coming into force of Solvency II. Finally, as had also happened in the Eurozone, in 2016 the "other investments" category increased considerably, whereas it had been used only very marginally prior to then.

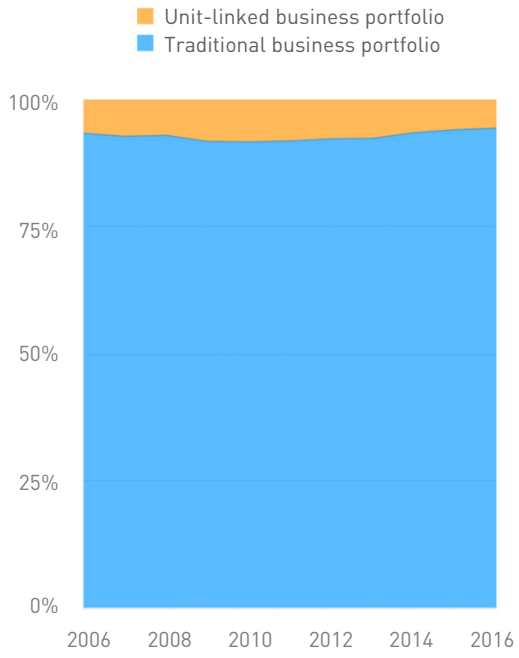
Chart 2.3-c illustrates the structural breakdown of the traditional business investment portfolio by asset type in the United Kingdom market in 2016. This information allows for the identification of the relative breakdown of the fixed income investments, specifying that 63% of this category of investment (or 35.2% of the total investment portfolio) represented corporate fixed income investments, while the remaining 37% (or 20.5% of the total portfolio) took the form of sovereign fixed income investments. This structure contrasted with the predominant trend in the Eurozone, and was closer to the behavior of the United States insurance market.

Chart 2.3-c
United Kingdom: structural breakdown of traditional business investment portfolios by asset type, 2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Chart 2.4-a
Spain: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

2.4 Spain

The Spanish insurance market has one of the smallest proportions of unit-linked investment portfolios in the Eurozone and the smallest in the sample we have analyzed, with a total of 5.5% in 2016. In addition, this proportion has remained stable throughout the decade for which the most recent information is available (see Table 2.4-a and Chart 2.4-a).

With regard to the evolution of the structure of the traditional business investment portfolio in Spain by asset type during the period 2006-2016, a similar trend can be observed to that shown by all the markets in the Eurozone. While in 2006, fixed income investment represented 62.7% of the total, by 2016 this percentage had risen to 75.7% (up by +13pp). This growth seems to have taken place at the expense of a reduction in cash and deposits during the period (down by -7.5pp). Variable-income, for its part, after a fall of -1.7pp between 2006 and 2012, started a process of recovery culminating in a 4.8% increase by 2016 (see Table 2.4-b and Chart 2.4-b).

Table 2.4-a
Spain: the structure of investment portfolios broken down by type of insurance business, 2006-2016
(%)

Type of business	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Traditional business portfolio	93.5%	92.9%	93.1%	91.9%	91.8%	92.0%	92.4%	92.5%	93.6%	94.2%	94.5%
Unit-linked business portfolio	6.5%	7.1%	6.9%	8.1%	8.2%	8.0%	7.6%	7.5%	6.4%	5.8%	5.5%

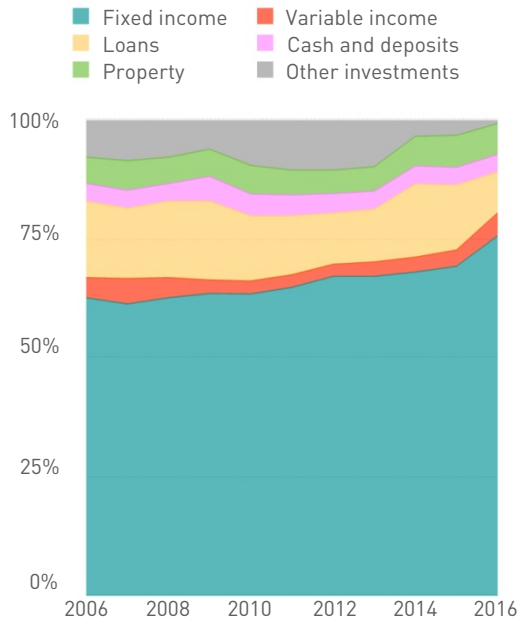
Source: MAPFRE Economic Research (with information from EIOPA)

Table 2.4-b
Spain: the structure of the traditional business investment portfolio broken down by asset type, 2006-2016
(%)

Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	62.7%	61.4%	62.7%	63.6%	63.5%	64.9%	67.2%	67.2%	68.1%	69.3%	75.7%
Variable income	4.2%	5.3%	4.2%	2.8%	2.7%	2.6%	2.5%	3.0%	3.1%	3.4%	4.8%
Cash and deposits	16.1%	14.8%	16.1%	16.6%	13.7%	12.4%	10.8%	11.1%	15.4%	13.7%	8.6%
Property	3.7%	3.8%	3.7%	5.2%	4.6%	4.4%	4.1%	3.8%	3.8%	3.7%	3.7%
Mutual Funds	5.5%	6.2%	5.5%	5.7%	6.0%	5.2%	4.9%	5.1%	6.2%	6.7%	6.5%
Other investments	7.8%	8.5%	7.8%	6.1%	9.5%	10.6%	10.5%	9.8%	3.3%	3.4%	0.7%

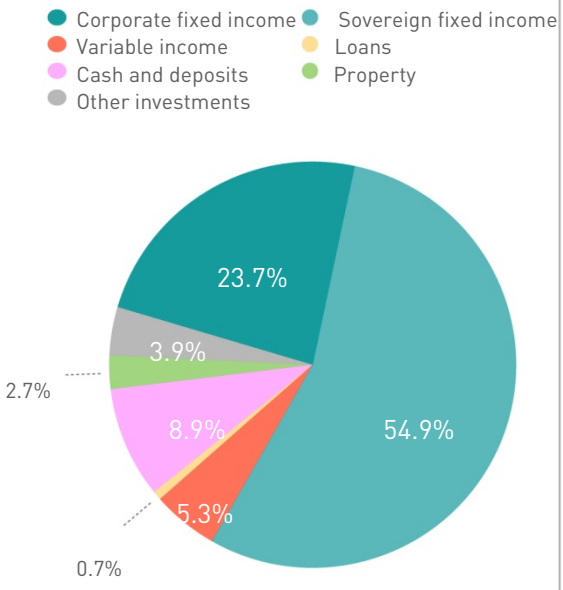
Source: MAPFRE Economic Research (with information from ICEA)

Chart 2.4-b
Spain: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from ICEA)

Chart 2.4-c
Spain: structural breakdown of traditional business investment portfolios by asset type, 2016
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Finally, the breakdown of the investment for 2016, illustrated in Chart 2.4-c, shows the predominance of sovereign fixed income, which represented 70% of the fixed income category (or 54.9% of the total investment portfolio), while corporate fixed income constituted the remaining 30% (or 23.7% of total investment). In Spain, therefore, the high percentage of investment in sovereign bonds is a characteristic feature compared with the markets already analyzed above.

2.5 Brazil

One particularity of the Brazilian insurance market is its practice of keeping a high percentage of the investment it manages in the form of mutual funds. Throughout the period 2006-2016, as is shown in Table 2.5 and in Chart 2.5-a, this form of investment represented

Table 2.5
Brazil: the structure of the traditional business investment portfolio broken down by asset type, 2006-2016
(%)

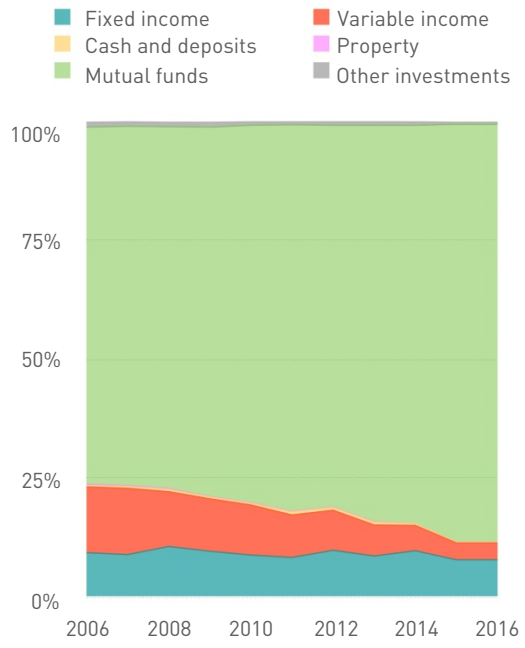
Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	9.5%	9.1%	10.8%	9.8%	9.0%	8.5%	10.0%	8.8%	9.9%	8.0%	8.0%
Variable income	13.8%	13.9%	11.5%	11.0%	10.5%	8.9%	8.4%	6.5%	5.3%	3.5%	3.5%
Cash and deposits	0.3%	0.4%	0.5%	0.4%	0.4%	0.7%	0.6%	0.6%	0.4%	0.2%	0.2%
Property	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
Mutual Funds	75.0%	75.5%	76.0%	77.6%	79.3%	81.2%	80.2%	83.3%	83.7%	87.8%	87.8%
Other investments	1.0%	0.9%	0.9%	1.0%	0.7%	0.6%	0.8%	0.8%	0.7%	0.4%	0.4%

Source: MAPFRE Economic Research (with information from SUSEP)

between 75% and 88% of the total, with an increase of 12.8pp overall during the period analyzed. Fixed income investment, for its part, remained stable over the same period, registering a slight reduction of the order of 1.5pp.

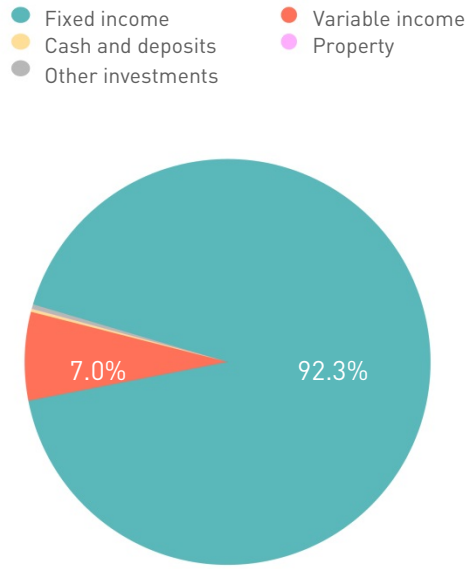
Another clearly identifiable trend in the Brazilian insurance market is the significant reduction in variable income investment, which fell from representing 13.8% of the total in 2006 to only 3.5% in 2016, a drop of -10.3pp (if we exclude mutual funds from the analysis of the breakdown).

Chart 2.5-a
Brazil: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from SUSEP)

Chart 2.5-b
Brazil: structural breakdown of traditional business investment portfolios by asset type, 2016
(%)



Source: MAPFRE Economic Research (with information from SUSEP)

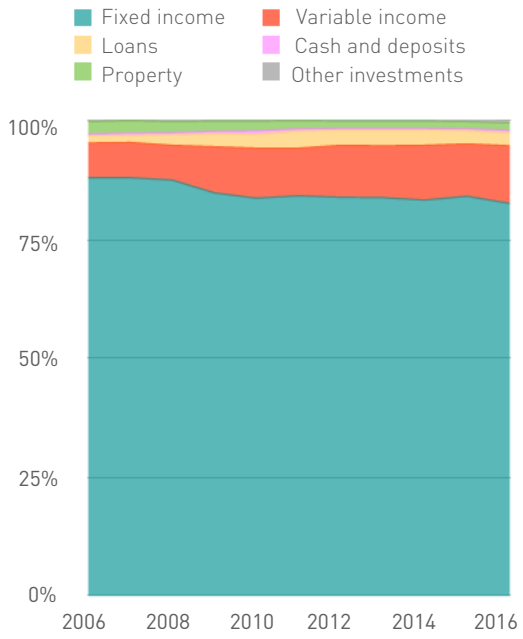
It should be noted that, according to information provided by SUSEP, the majority of assets invested through mutual funds are in fact fixed income securities, as is shown in Chart 2.5-b. Thus, based on 2016 data, the Brazilian insurance market's fixed income investment represented 92.3% of the total investment portfolio.

2.6 Mexico

In the case of the Mexican insurance market, a strong predominance of fixed income investment is also observed within investment portfolios throughout the period 2006-2016 (see Table 2.6-a and Charts 2.6-a and 2.6-b).

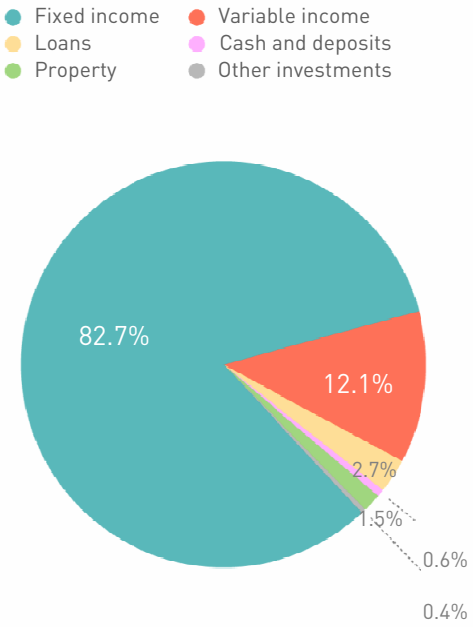
During the same period, however, the proportion of fixed income investment was reduced from 88.1% to 82.7% (a fall of -5.4pp), while the proportion of variable income investment grew by 4.8pp, rising from 7.3% in 2006 to 12.1% in 2016. Other clearly identified features are an increase in the category of loans (up by +1.2pp) and a small fall in property investments (down by -1.1pp).

Chart 2.6-a
Mexico: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)



Source: MAPFRE Economic Research (with information from CNSF)

Chart 2.6-b
Mexico: structural breakdown of traditional business investment portfolios by asset type, 2016
(%)



Source: MAPFRE Economic Research (with information from CNSF)

Table 2.6
Mexico: the structure of traditional business investment portfolios broken down by asset type, 2006-2016
(%)

Asset type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Fixed income	88.1%	88.1%	87.6%	84.9%	83.8%	84.3%	84.0%	83.9%	83.4%	84.2%	82.7%
Variable income	7.3%	7.4%	7.3%	9.7%	10.5%	10.0%	10.9%	10.9%	11.5%	11.0%	12.1%
Loans	1.5%	1.5%	2.2%	2.7%	2.9%	3.6%	3.2%	3.3%	3.2%	2.8%	2.7%
Cash and deposits	0.4%	0.5%	0.5%	0.6%	0.8%	0.5%	0.4%	0.4%	0.4%	0.4%	0.6%
Property	2.6%	2.6%	2.3%	2.1%	2.0%	1.7%	1.5%	1.5%	1.5%	1.5%	1.5%
Other investments	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-0.0%	0.0%	0.0%	0.0%	0.4%

Source: MAPFRE Economic Research (with information from CNSF)

3. Overview of the markets analyzed

In order to provide a quantitative overview of the analysis presented in the preceding section of this report, we now bring together for the purpose of comparison the most relevant information for the markets analyzed concerning investment portfolio structure for 2016 (the most recent year for which data are available for all the markets concerned).

Firstly, Table 3-a presents an overview of the structural breakdown of the traditional business investment portfolio by asset type in the markets for which this information is available (the Eurozone, the United States, the United Kingdom and Spain). This information marks out the Spanish insurance market as representing the highest proportion of fixed income in its investment portfolio, and as also having the largest concentration of sovereign fixed income.

In addition, Table 3-b provides a breakdown by asset type of the traditional business investment portfolio for all the markets analyzed. The attention is caught here again by the high

Table 3-a
Selected markets: overview of the structural breakdown of traditional business investment portfolios by asset type, 2016
(%)

Asset type	Eurozone	United States	United Kingdom	Spain
Corporate fixed income	31.5%	50.3%	35.2%	23.7%
Sovereign fixed income	32.9%	15.6%	20.5%	54.9%
Variable-income	17.9%	13.1%	17.4%	5.3%
Loans	4.6%	9.7%	7.5%	0.7%
Cash and deposits	2.8%	4.0%	8.9%	8.9%
Property	1.9%	0.7%	2.4%	2.7%
Other investments	8.4%	6.6%	8.0%	3.9%

Source: MAPFRE Economic Research (with information from EIOPA and NAIC)

Table 3-b
Selected markets: overview of the structure of traditional business investment portfolios broken down by asset type, 2016
(%)

Asset type	Eurozone	United States	United Kingdom	Spain	Brazil	Mexico
Fixed income	64.4%	65.9%	55.7%	78.6%	92.3%	83.0%
Variable income	17.9%	13.1%	17.4%	5.3%	7.0%	12.2%
Loans	4.6%	9.7%	7.5%	0.7%		
Cash and deposits	2.8%	4.0%	8.9%	8.9%	0.2%	2.8%
Property	1.9%	0.7%	2.4%	2.7%	0.0%	0.6%
Other investments	8.4%	6.6%	8.0%	3.9%	0.4%	1.5%

Source: MAPFRE Economic Research (with information from EIOPA, NAIC, SUSEP and CNSF)

concentration of fixed income investment (both corporate and sovereign) throughout the sample comprising the analysis. As mentioned previously, this predominance can be explained to a large extent by the fact that the insurance business model involves the need to implement liability-driven investment strategies in order to achieve an appropriate match in terms of maturity and interest rates between recognized liabilities and the investment instruments that back them up.

It is likewise observed that, in addition to the above, in countries with insurance markets with a lower level of development (in terms of the volume of their portfolios' assets) the percentage of investment in fixed income values is higher, while the percentages of variable income investment are correspondingly lower.

Finally, Table 3-c shows the information relating to the importance of the portfolio of Investments associated with unit-linked business products, for those markets analyzed here in which such information is available. As was mentioned previously in the corresponding analysis, a relative lack of prominence of this type of product is clearly identifiable in the Eurozone countries (and particularly in Spain) when compared with the United Kingdom.

Table 3-c
Selected markets: the structure of investment portfolios broken down by type of insurance business, 2016
(%)

Type of business	Eurozone	United Kingdom	Spain
Traditional business portfolio	84.8%	45.8%	94.5%
Unit-linked business portfolio	15.2%	54.2%	5.5%

Source: MAPFRE Economic Research (with information from EIOPA)

4. Capital charges applicable in the European Union

One of the aspects that would seem to be influencing the trends observed in the composition of investment portfolios in Europe is the question of the capital charges applicable under the new Solvency II regulations.

In this respect a comparative study is shown below of the gross regulatory capital charges by asset type, as imposed on insurance companies applying the Solvency II standard formula. This shows the capital charges applicable to the most representative categories within insurers' investment portfolios.

4.1 Investment in fixed income bonds

Investments in fixed income bonds have specific capital charges derived from the following factors: (i) their spread risk and concentration risk, which depend on the type if asset; (ii) their credit risk rating: (iii) the residual maturity of the bond weighted by the amount of future flows (with modified duration), and (iv) concentration with the same counterparty.

Furthermore, additional capital charges may be decided in the event of defective management of the risk of unbundling of cash-flows and/or currency provisions between assets and liabilities.

Capital charges for spread risk

Table 4.1 shows a comparative study of the gross capital charges applicable to different bond types per year of duration. As can be seen from this information, the capital charges vary negatively (i.e., with a higher level of requirement) in accordance with the instrument's inherent risk and lower credit risk rating.

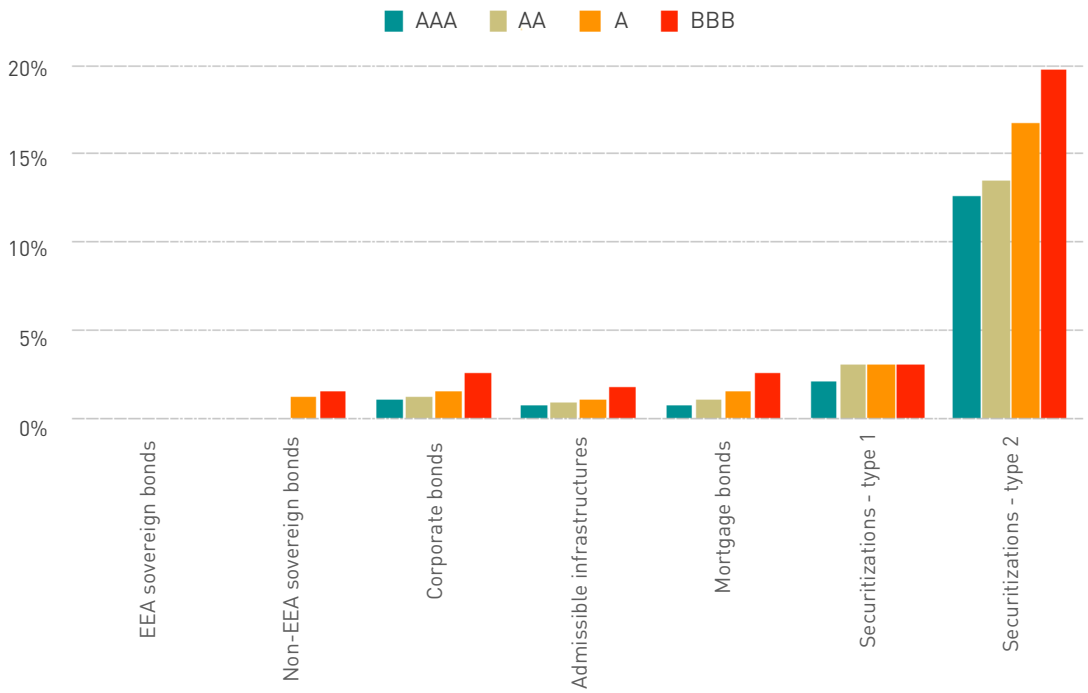
To calculate the total gross charge for a specific bond, its modified duration must be multiplied by the percentages appearing in Table 4.1. For durations higher than five years, the percentages applicable for excessive duration are somewhat lower, with the objective of not penalizing excessively long-term investment[2].

Table 4.1
Gross capital charges applicable to bonds per year of duration
(%)

Credit rating**	EEA sovereign bonds	Non-EEA sovereign bonds	Corporate bonds	Admissible infrastructures	Mortgage bonds	Securitizations - type 1	Securitizations - type 2
AAA	0.00%	0.00%	0.90%	0.64%	0.70%	2.10%	12.50%
AA	0.00%	0.00%	1.10%	0.78%	0.90%	3.00%	13.40%
A	0.00%	1.10%	1.40%	1.00%	1.40%	3.00%	16.60%
BBB	0.00%	1.40%	2.50%	1.67%	2.50%	3.00%	19.70%
BB	0.00%	2.50%	4.50%	4.50%	4.50%	82.00%	82.00%
B	0.00%	4.50%	7.50%	7.50%	7.50%	100.00%	100.00%
Lower than B	0.00%	4.50%	7.50%	7.50%	7.50%	100.00%	100.00%

Source: MAPFRE Economic Research (with information from EIOPA)
* European Economic Area (EEA)
** See the link to the Equivalence Table indicated in Reference Point 3 to this report (p. 31).

Chart 4.1
Capital charges per year of duration: investment-grade bonds
(%)



Source: MAPFRE Economic Research (with information from EIOPA)

Chart 4.1 illustrates the pattern of capital charges, comparing the gross charges per year of duration for bonds situated in the investment grade range.

It can be seen that investments in sovereign bonds from countries in the European Economic Area (EEA) do not have capital charges for spread risk, provided that they are denominated and financed in their own currency. Nevertheless, if currencies and durations are not correctly managed, this could give rise to a capital charge as a result of fluctuations in risk-free interest rates and/or exchange rates, in the event of the unbundling of cash-flows and/or currency provisions between assets and liabilities. In addition, an increase in market spreads would affect the levels of shareholders' equity admissible to cover capital requirements, in the event of a fall in the market value of the sovereign bonds concerned.

If we are dealing with investment in the sovereign debt of countries other than EU Member States with a credit rating of AAA or AA (or the equivalent[3]), capital charges are not involved either when it comes to covering spread risk. For lower credit ratings, the capital charge will depend on the rating and the modified duration of the bond concerned.

As an example, a sovereign debt bond from countries other than EU Member States with a credit rating of A and a duration of five years would have a gross capital charge of 5.5%. If its duration is ten years, the charge would be 8.4%. If the bond had a rating of BBB, the charges would be 7% and 10.5% respectively. Bonds that lack a rating have specific capital charges that fluctuate in a range somewhere between the charges applicable to BBB and BB ordinary corporate bonds.

It is important to point out that these percentages are applied both to direct investments and to investments implemented through mutual funds, to which the so-called "look-through" approach is applied.

Capital charges by concentration risk

Further, if there are concentrated risks with a specific counterparty over and above a specific threshold, an additional capital charge is applied. In general, insurance companies do not usually exceed such thresholds, which are normally above those specified in their risk management policies and within limit control parameters. Nevertheless, the capital charges arising from non-compliance strongly penalize concentration risk.

As an example of the above, an investment in an AA bond belonging to a counterparty whose exposure exceeds 3% of the company's total assets would have an additional charge 12% above the excess exposure. If we are dealing with a BBB bond, the capital surcharge would be 27% above excess exposure greater than 1.5% above the company's total assets.

4.2 Investment in shares

The gross capital charge applicable to investments in shares listed on regulated markets within Organization for Economic Cooperation and Development (OECD) countries is 39% of the value of the shares concerned. This charge must in its turn be adjusted by the so-called "symmetrical adjustment", which has countercyclical effects within limits of between -10% and +10%. This adjustment is published every month by EIOPA, and in March 2018 represented an adjustment of -0.88pp.

Nevertheless, there currently continues to be a transitory regime that allows for the application of lower charges until 2022, inclusive, increasing progressively by 2.5% until reaching 39% by 2023 (plus/minus the countercyclical adjustment).

For variable income instruments for investment in infrastructures and which comply with the admissibility requirements for receiving preferential treatment, the gross capital charge is 30%, plus 77% of the symmetrical adjustment foreseen for investment in shares (in March 2018 this would be 77% of -0.88%). For non-listed shares, the capital charge is 49% plus symmetrical adjustment.

There are also special cases in which capital charges can end up being lower, as in the case of strategic acquisitions.

4.3 Capital charges for property investments

The gross capital charge for market risk for property investments is 25% of the value of the property. As in the case of other assets, this percentage is applied both to direct investments and to investments implemented through mutual funds, to which the so-called "look-through" transparency approach is applied.

There is an additional capital charge in the event of excess exposure in the case of a single property. The excess threshold is 10% of the value of all the assets of the insurance company, excluding from this calculation certain assets such as those corresponding to Life Insurance contracts in which the person taking out the insurance assumes fully the investment risk. The additional capital charge would be 12% above the excess. Properties located in the same building are considered as a single property.

4.4 Additional considerations

Finally, it is important to point out that exposed capital charges are gross charges. Profits from diversification, the capacity to absorb losses for deferred taxation, and the fact that investments may be assigned to portfolios of products with participation in discretionary profits mean that capital charges in terms of shareholders' equity requirements may be lower, depending on the risk profile of the insurance company concerned.

The capacity to absorb losses for deferred taxation may reduce the capital charge to a percentage equivalent to the rate of corporation tax. Likewise, the capacity to absorb losses through technical provisions will depend on the products that the company has in its portfolio.

References

1/ The following link provides details of the portfolio distribution at the close of the second quarter of 2017, for each of the countries in the EU/EEA: https://eiopa.europa.eu/Publications/Reports/Financial_Stability_Report_December2017.pdf (page 57).

2/ Article 176 of Delegated Regulation (EU) 2015/35 (Solvency II): https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02015R0035-20170915

3/ Table of Equivalence of credit ratings from EIOPA: https://eur-lex.europa.eu/eli/reg_impl/2016/1800/oj

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