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Analyzing catastrophe data in Spain

"The *Extraordinary Risk Statistics* is one of the longest standing annual publications issued by the Consorcio de Compensación de Seguros (CCS). The 2020 release contains data for the period 1971-2019. This publication is a basic information source and indeed provides an X-ray of damage caused by the so-called 'extraordinary' risks in Spain. Being fully aware of the importance of this information, we have thought it appropriate to issue it as a virtually monographic number of our magazine.

Summary

Editors Board

The Consorcio de Compensación de Seguros digital magazine "Consorseguros" (CCS) is published every six months, its content particularly addressing matters related to the Consorcio's activities in various fields of insurance, reflecting on and analysing them.

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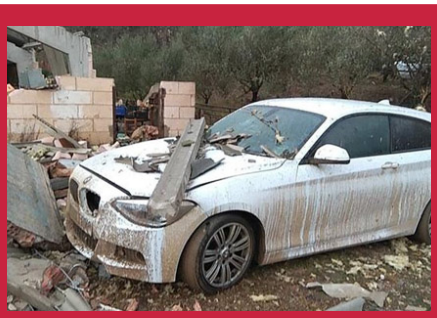
Editorial

The *Extraordinary Risk Statistics* is one of the longest standing annual publications issued by the Consorcio de Compensación de Seguros (CCS). The 2020 release contains data for the period 1971-2019. This publication is a basic information source and indeed provides an X-ray of damage caused by the so-called 'extraordinary' risks in Spain. Starting this year, 2020, it will no longer be released on paper, in keeping with current concerns and customs, though as in the past it will continue to be made available to the public, in the form of a PDF file on our website. Being fully aware of the importance of this information, we have thought it appropriate to issue it as a virtually monographic number of our magazine.



The *Extraordinary Risk Statistics* is one of the longest standing annual publications issued by the Consorcio de Compensación de Seguros (CCS). The 2020 release contains data for the period 1971-2019. This publication is a basic information source and indeed provides an X-ray of damage caused by the so-called 'extraordinary' risks in Spain.

Our co-workers Belén Soriano, María de los Ángeles Horrillo, and Pedro Comesaña at the CCS's Subdirección Técnica y de Reaseguro [*Technical Area and Reinsurance Sub-directorate*] in the Dirección Financiera [*Financial Direction*] have been most directly involved in writing the papers released in this number, which kicks off with an analysis offering an overview of these risks over the past 25 years. This period was chosen not only because of the significance attaching to a quarter of a century but also because of the uniformity of sources and granularity of the data, conducive to graphic representation and interpretation. The *Technical Area and Reinsurance Sub-directorate* has also provided two more studies on the impact of relevant measures performed using this information: a paper on the implementation of the new Sistema de Información de Recargos [*Surcharge Reporting System*] (SIR), which has replaced the statistical data sheets insurance companies formerly used to submit information on exceptional risk exposure and provides fuller and better quality information, and a paper analysing the practical impact of the reduction in the extraordinary risk surcharge rate applied in 2018 on the surcharge revenues collected by the Consorcio.

In a further paper from the Subdirección de Estudios y Relaciones Internacionales [*Studies and International Relations Sub-directorate*], Francisco Espejo presents a detailed analysis of the geographical distribution of the main peril in terms of frequency and cost in Spain: flooding.

A contribution by María José Jiménez and Mariano García, researchers at the CSIC [*Spanish National Research Council*], looks at the value of catastrophic risk data in the framework of two research projects carried out with CCS participation and highlights the importance of proper compilation and management of this type of data as an essential tool in lessening disaster risks and adapting to climate change.

In the section entitled *News*, the Consorcio's Risk Management Director, María Nuche, reviews the guide to the "Risk Management Function in Insurance Companies" recently published by AGERS, Asociación Española de Gerencia de Riesgos y Seguros [*Spanish Risk Manager's Association*].

And lastly, in the section entitled *Reviews*, our co-worker José Antonio Badillo discusses a recent court ruling on the subject of defining and assessing property damage, here in connection with motor vehicle insurance.

Loss rate analysis for the extraordinary risks covered by the Consorcio de Compensación de Seguros, 1995-2019

María Ángeles Horrillo Muñoz - Senior Expert, Technical Area and Reinsurance Sub-directorate
Belén Soriano Cavero - Deputy-Director for the Technical Area and Reinsurance
Francisco Espejo Gil - Deputy-Director for Studies and International Relations
Consorcio de Compensación de Seguros

The Consorcio de Compensación de Seguros' compilation of *Extraordinary Risk Statistics* is published yearly and is one of its longest standing and most impactful publications. Its latest issue in 2020 presents statistics on the claims paid by the Consorcio over the past 49 years (time series for 1971-2019). Except as otherwise indicated, this paper analyses and presents the data for the last 25 years, 1995-2019, a time span for which a uniform level of detail is available and claims have been handled using the same data processing system. Furthermore, the period is sufficiently long and includes the worst events for each cause currently covered, so it is representative.

The losses considered are claims for which indemnities had been paid or set aside (provisions for outstanding claims) on the closing date for data collection (29 February 2020). Therefore, losses incurred but not reported have not been included and these statistics will be expanded subsequently as reports come in.

Indemnities are accounted excluding deductibles and applying the rule of proportional insurance where applicable. Claim handling costs, such as payments to loss adjusters and lawyers and other expenses, have also not been included.

Loss distributions have been based on the date of occurrence of the loss, irrespective of the reporting or payment date.

Amounts have been expressed in millions of current euros current on 31 December 2019.

The information has been structured as follows:

1. Property damage.

   1.1 Loss rate by cause.
   1.2 Loss rate by cause and risk category.
   1.3 Loss rate by cause and month of occurrence.
   1.4 Loss rate by cause and province of occurrence.

2. Property Damage, Business Interruption (Pecuniary Losses), and Personal Injury.

   2.1 Loss rate by cause.
   2.2 Loss rate by the most significant events in the series.

3. Property damage: Premium consumption and loss frequency.

1. PROPERTY DAMAGE

1.1 LOSS RATE BY CAUSE

Property damage has been analysed as the modality that accounts for the greatest share of the losses indemnified by the Consorcio de Compensación de Seguros (CCS).

The analysis of the loss rate by main causes is graphically represented in Figures 1, 2, and 3 and in Table 1. The first conclusion is that over the past 25 years, 95 % of the 7,031 million 2019 euros paid as compensation for 1,294,171 separate claims had a natural cause, and only 5 % were directly attributable to the hand of man. In numbers, damage due to natural causes accounted for 6,702 million euros (in 1,274,104 separate claims, 98 % of the total), while damage due to man-made causes accounted for 329 million euros (in 20,067 separate claims, 2 % of the total).

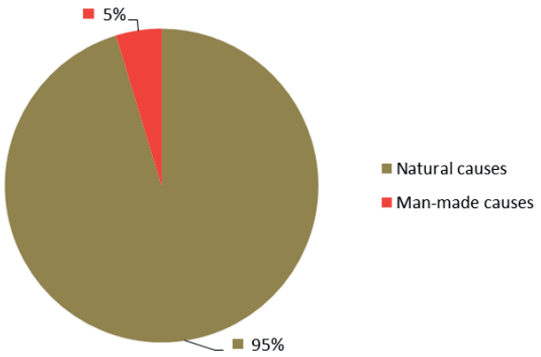


Figure 1. Breakdown of total damage by cause, natural or man-made, over the past 25 years.

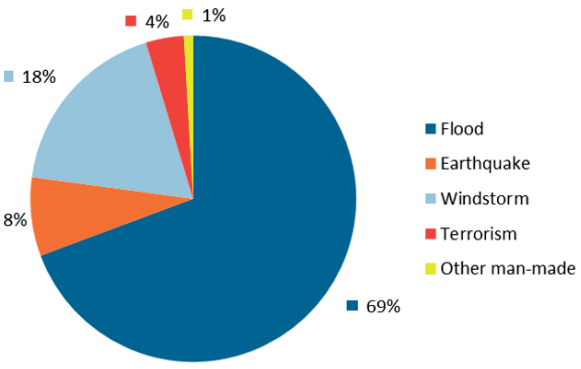


Figure 2. Breakdown of total damage by main causes over the past 25 years.

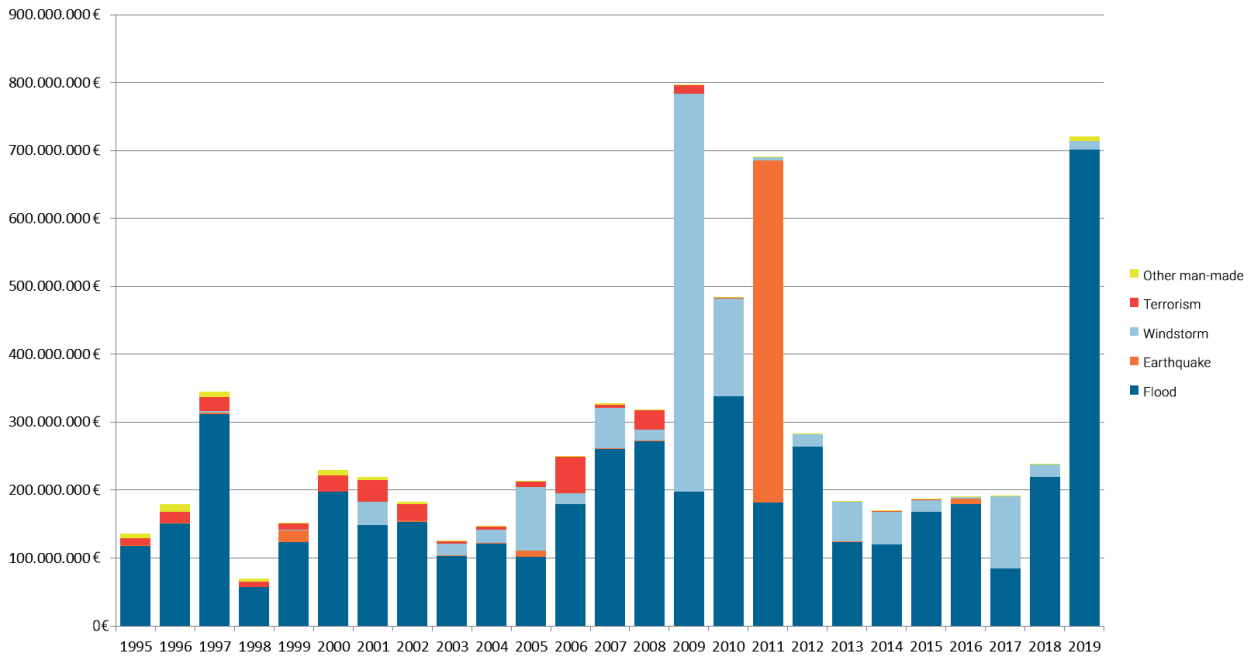


Figure 3. Breakdown of total damage by cause by year over the past 25 years.

Flooding is the most important natural peril in Spain, as it is in the rest of Europe, and was the cause for 69 % of the compensation paid. By importance, wind damage (windstorms qualifying for the label of Atypical Cyclonic Storm, or TCA for the Spanish) is the second cause. That is, hydrometeorological perils caused 87 % of the total damage. The third-most important peril was geological, earthquake, which accounted for 8 % of the total damage. The extraordinary risk insurance scheme in Spain also covers damage caused by volcanic activity, but there have been no volcanic eruptions in Spain in these last 25 years, so this peril has caused no damage. Turning to the 5 % of damage caused by man, 80 % of that damage (4 % of the total), was caused by terrorist acts, 19 % by civil commotion, 1 % to action by the armed forces and law enforcement in peacetime, and less than 1 % to riots.

Figure 3 depicts the time trend in damage by year and shows that flooding was not only the largest peril in the total, it was also the most frequent and recurring risk. Flooding in 2019 was particularly noteworthy (this has been dealt with in previous issues of this magazine). We need to go back to 1983, which falls outside this time series, to find a year with as much flood loss.

Geological perils – earthquake for purposes of this paper – are less frequent but have a potentially higher impact, as can be seen from the breakdown of damage in 2011, in which the damage caused by the earthquake in Lorca (Murcia) on 11 May, the most important seismic event in the history of the CCS, is clearly prominent. Wind damage is more erratic, and there are two reasons for this. One is the dynamics of weather phenomena themselves: the atmospheric circulation is more active in some years than in others. The other is changes in how this peril has been considered under the extraordinary risk insurance scheme over the period in question. A highly technical, restrictive definition of atypical cyclonic storms was changed to another, more functional definition that added a minimum wind gust threshold, which was lowered, and also included tornados, so more and more storm damage has gained coverage under the extraordinary risk insurance scheme.

This series also reveals that, fortunately, compensation paid by the CCS for terrorist acts has also been diminishing. Cessation of activity by the ETA terrorist group towards the end of the first decade of this century has been clearly reflected in a near absence of indemnities for property damage for this cause.

Mean annual compensation for natural causes over the past 25 years has been 268 million euros, for man-made causes 13 million euros.

TIME SERIES 1995-2019	INDEMNITIES	% INDEMNITIES	NO. OF CLAIMS
FLOOD	4,875	69%	629,212
EARTHQUAKE	548	8%	42,549
WINDSTORM	1,279	18%	602,343
TOTAL NATURAL CAUSES	**6,702**	**95%**	**1,274,104**
TERRORIST ACTS	263	4%	13,344
RIOTS	1	0%	70
CIVIL COMMOTION	62	1%	4,752
ARMED FORCES ACTIONS	4	1%	1,901
TOTAL MAN-MADE CAUSES	**329**	**5%**	**20,067**
TOTAL	**7,031**	**100%**	**1,294,171**

In millions of current euros as of 31 December 2019.
N.B.: Percentage compensation for each cause has been calculated on the total for natural causes plus man-made causes.
Table 1. Compensation and number of claims for extraordinary risks for the time series 1995-2019.

There follow some conclusions resulting from our analysis of the data for the number of **claims and mean costs** for natural and man-made causes.

Plotting the number of claims from natural and man-made causes separately (Figures 4 and 5) shows claims from natural causes to far outnumber claims from man-made causes. The peak number of claims from natural causes was 298,130 in 2009 (mainly due to storm Klaus, which accounted for 270,161 claims), compared to a peak of 2,468 claims from man-made causes in the year 2000, mainly due to terrorism and civil disorders.

For the time series considered, 1995-2019, the mean number of claims for which the CCS paid compensation annually, for both natural causes and man-made causes, was 50,964 and 803, respectively.

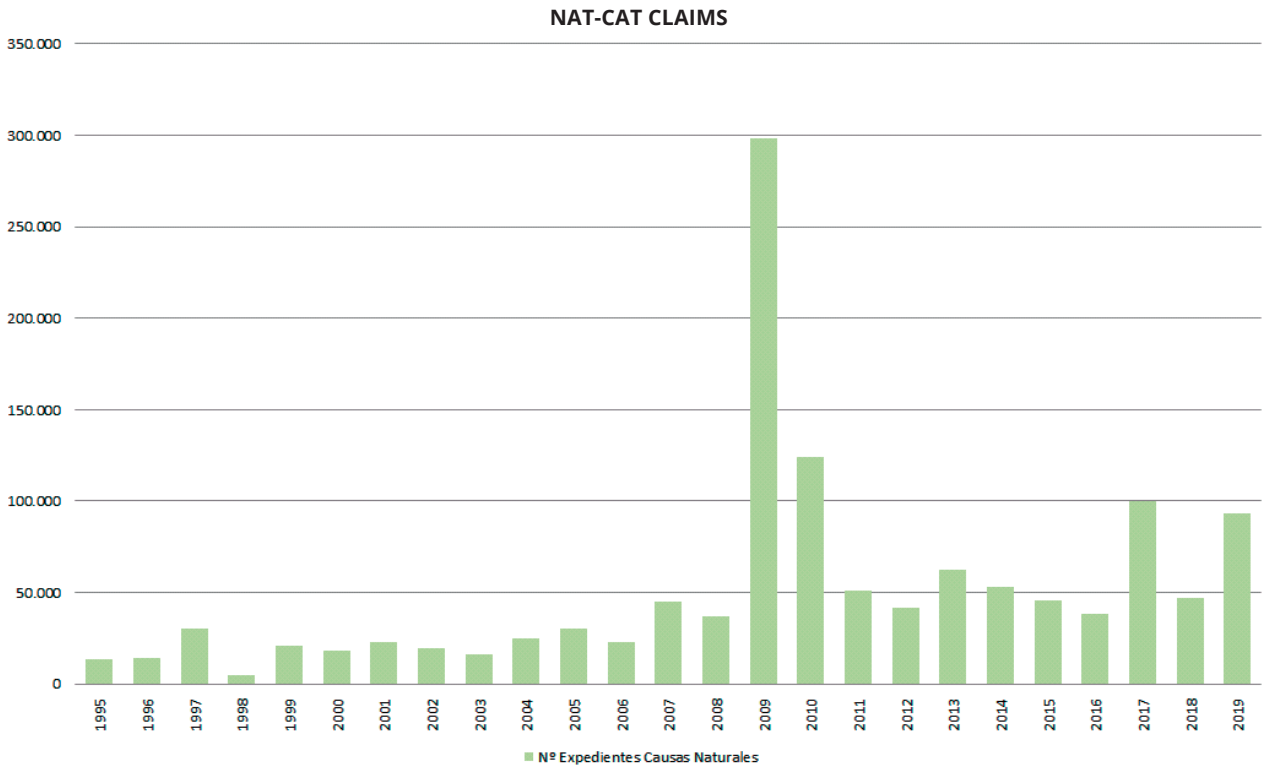


Figure 4. Annual number of property damage claims for extraordinary risks due to natural causes (1995-2019).

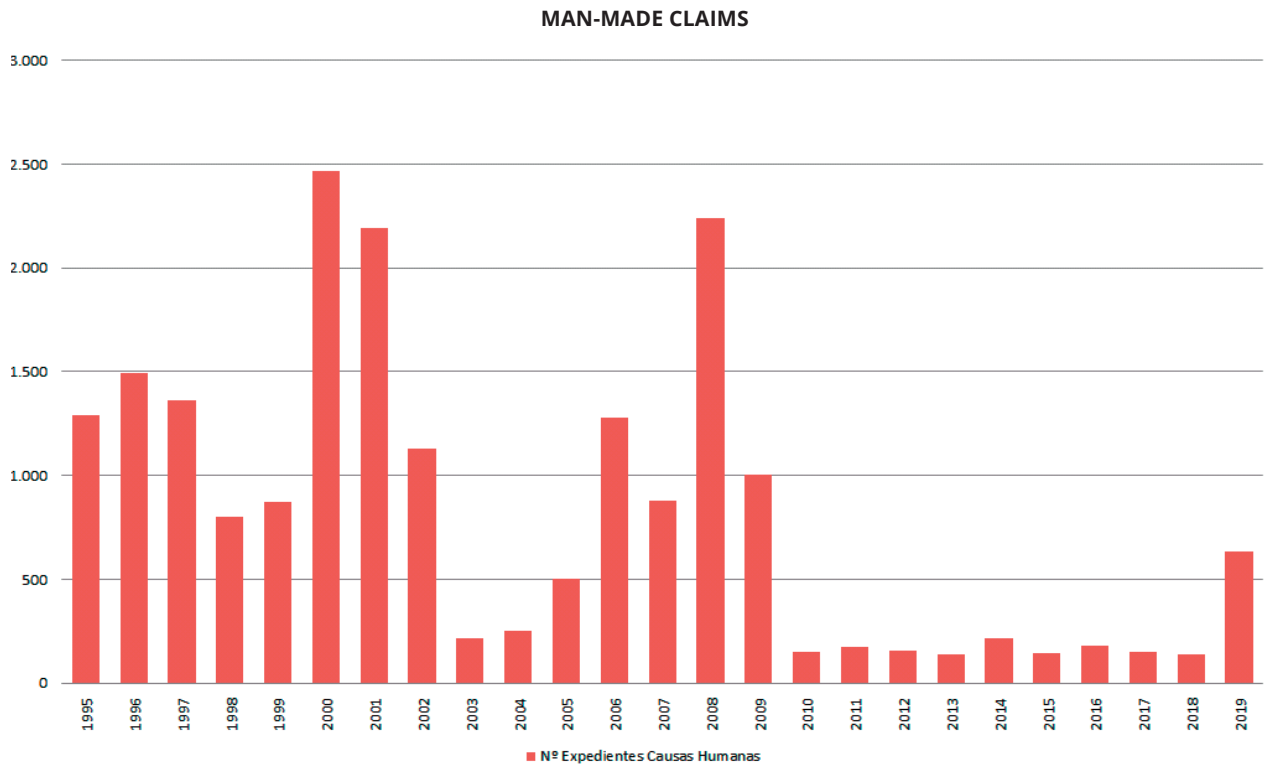


Figure 5. Annual number of property damage claims for extraordinary risks due to man-made causes (1995-2019).

Figure 6 illustrates the mean cost per claim for man-made causes and natural causes over the time series for 1995-2019 and shows that the mean costs for natural causes are in most years lower than the mean costs for man-made causes.

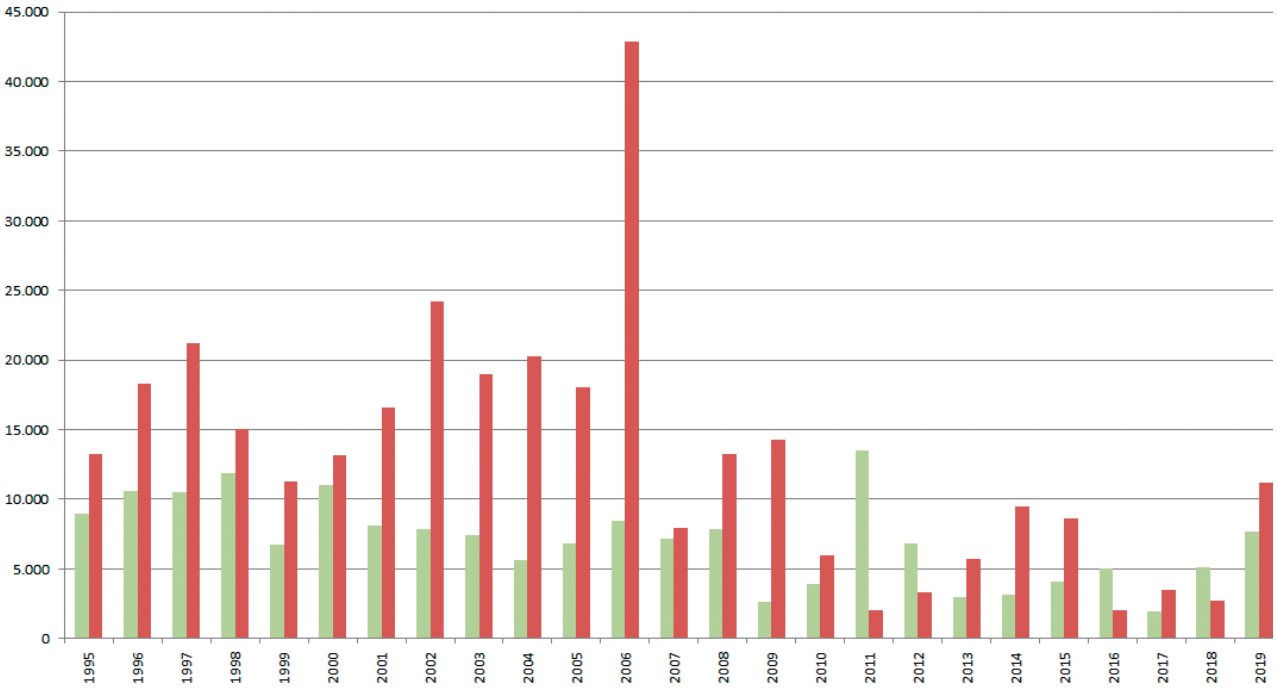


Figure 6. Mean annual cost per claim for natural (green) and man-made (red) causes in 2019 euros.

1.2 LOSS RATE BY CAUSE AND RISK CATEGORY

For purposes of graphically representing the data, the different risk categories in the extraordinary risk insurance scheme rate schedule were grouped into three: homes and apartment buildings, other risks, and motor vehicles. The "other risks" group includes offices, commercial businesses, industry, infrastructure, and miscellaneous, in short, risks associated with companies, businesses, or public property.

Table 2 presents a breakdown by cause and risk category for the time series considered and discloses differences in the susceptibility of the different types of property to different causes. For example, flooding affects the other risks group more than windstorms, which have a greater impact on homes and motor vehicles. The effects of earthquake are more concentrated on homes because of where and how the most significant earthquake event occurred (the Lorca earthquake) and also because the level of insurance for infrastructure (public works), which is owned by governments, is most often not as high as for other types of risks, and accordingly infrastructure is not covered under the extraordinary risk insurance scheme.

NATURAL CAUSES

TIME SERIES 1995-2019	FLOOD		EARTHQUAKE		WINDSTORM		NATURAL CAUSES	
HOMES AND APARTMENT BUILDINGS	1,602	33%	458	84%	609	48%	**2,669**	**40%**
OTHER RISKS	2,719	56%	89	16%	638	50%	**3,445**	**51%**
MOTOR VEHICLES	554	11%	1	0%	32	3%	**588**	**9%**
TOTAL	**4,875**	**100%**	**548**	**100%**	**1,279**	**100%**	**6,702**	**100%**

In millions of current euros as of 31 December 2019.
Table 2. Share of property affected according to the type of natural cause (1995-2019).

MAN-MADE CAUSES

TIME SERIES 1995-2019	TERRORISM		RIOTS		CIVIL COMMOTION		ARMED FORCES ACTIONS		MAN-MADE CAUSES	
HOMES AND APARTMENT BUILDINGS	49	19%	0.1	8%	6	10%	3.0	84%	58	18%
OTHER RISKS	176	67%	0.4	63%	43	69%	0.4	10%	219	67%
MOTOR VEHICLES	38	14%	0.2	28%	13	21%	0.2	6%	52	16%
TOTAL	**263**	**100%**	**0.7**	**100%**	**62**	**100%**	**3.6**	**100%**	**329**	**100%**

In millions of current euros as of 31 December 2019.
Table 3. Share of property affected according to the type of man-made cause (1995-2019).

For man-made causes (Table 3), terrorism, riots, and civil commotion all accounted for a similar share of the other risk's category. Where there were differences was in the share of riots and civil commotion on homes and motor vehicles. Damage caused by the armed forces actions and law enforcement agencies was concentrated on homes because of the nature of the most common type of loss, where the police break into a home where a crime is being committed or criminals are hiding is the typical scenario for this kind of events.

Figures 7 and 8 illustrate the total shares of compensation paid for natural and man-made causes for each of these three groups. Damage due to natural causes was split practically equally between what we have called damage to businesses, represented by the category of other risks (51 %), and damage to non-commercial property, represented by homes and motor vehicles (49 %). For losses from man-made causes, businesses (67 %) were affected more than private property (34 %). As a whole, from all causes, the percentage damage to homes was 39 %, to motor vehicles 9 %, and the largest share, 52 % of the total, to the other risk's category, which, to reiterate, groups together the different types of economic activities.

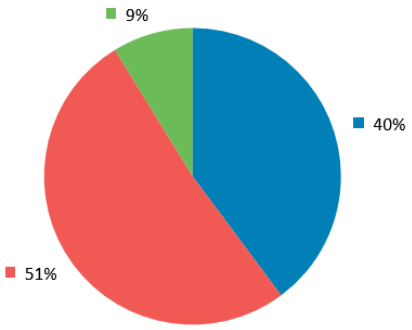


Figure 7. Percentage compensation for natural causes by risk category (1995-2019).

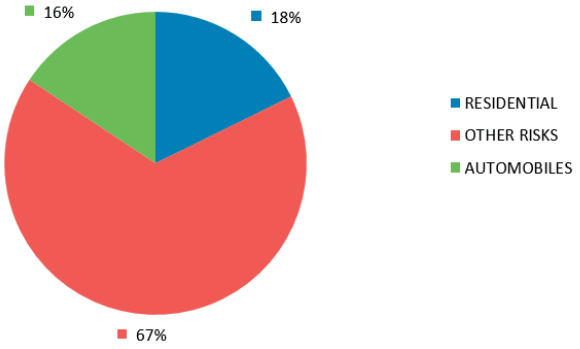


Figure 8. Percentage compensation for man-made causes by risk category (1995-2019).

Looking now at the number of claims instead of at compensation, for natural and man-made causes taken together, most claims were related to homes and apartment buildings, accounting for 70 % of the total claims, compared with 17 % for other risks and 13 % for motor vehicles.

1.3 LOSS RATE BY CAUSE AND MONTH OF OCCURRENCE

Table 4 sets out the claims paid by the CCS by natural cause and month of occurrence over the time series 1995-2019.

NATURAL CAUSES

TIME SERIES 1995-2019	January	February	March	April	May	June	July	August	September	October	November	December	Total
FLOOD	253	248	238	77	144	465	142	238	1,475	709	385	500	**4,875**
%	5%	5%	5%	2%	3%	10%	3%	5%	30%	15%	8%	10%	**100%**
EARTHQUAKE	17	18	0.3	0.4	506	0.1	0.2	3	1	0.4	1	1	**548**
%	3%	3%	0%	0%	92%	0%	0%	1%	0%	0%	0%	0%	**100%**
WINDSTORM	636	203	15	2	1	5	11	33	48	75	155	96	**1,279**
%	50%	16%	1%	0%	0%	0%	1%	3%	4%	6%	12%	7%	**100%**
NATURAL CAUSES	**907**	**469**	**253**	**79**	**651**	**470**	**154**	**274**	**1,524**	**784**	**540**	**596**	**6,702**
%	**14%**	**7%**	**4%**	**1%**	**10%**	**7%**	**2%**	**4%**	**23%**	**12%**	**8%**	**9%**	**100%**

Table 4. Claims paid by natural cause and month of occurrence (1995-2019).

Evaluating this breakdown is appropriate for hydrometeorological perils (flood and wind), as shown in Figures 9 and 10.

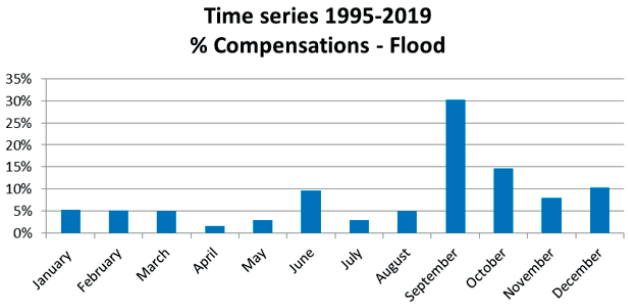


Figure 9. Percentage compensation for flood damage by month (1995-2019).

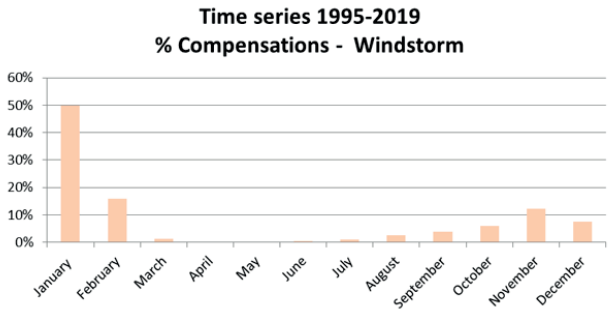


Figure 10. Percentage compensation for wind damage by month (1995-2019).

For flooding, claims display a pronounced tendency to be concentrated in the final months of the year, with a peak in September, with 1,475 million euros being paid out, 30 % of the total compensation paid out for flood damage in that month in the time series considered. This finding can be explained by the cut-off lows that ordinarily beset eastern mainland Spain and the Balearic Islands at that time of year. This topic was examined in greater detail in issue number 11 of this magazine and is also dealt with by an assessment of loss rate by cause and by province below.

Compensation paid for wind damage can be observed to be concentrated in the winter months, especially January, which accounts for 50 % of the total indemnities paid for all months combined (636 million euros), followed by February, which alone accounts for 16 % of the total, 203 million euros, and November, which accounts for 12 %, 155 million euros. The four months from November to February (November plus meteorological winter) account for 85 % of the compensation paid for wind over the entire year (1,090 out of 1,279 million euros) as a result of explosive cyclogenesis or the passage of extremely active low-pressure systems with strong winds through Spain.

Just as in the case of the geological causes, the monthly distribution of losses from man-made causes does not have any seasonal component and is highly contingent on singular events of major importance.

Taking all the causes together leads to the conclusion that extraordinary risk insurance activities can be divided into six very busy months from September to February and another six more sluggish months from March to August. This is an effect of the large share of flooding and high winds, though major singular events are not to be discounted. There are always exceptions, like the heavy storms that can occur in the summer and mostly cause severe pluvial flooding.

1.4 LOSS RATE BY CAUSE AND PROVINCE OF OCCURRENCE

The ability to use the CCS's data on indemnities paid to plot on a map the areas of greatest risk by cause of loss, especially for natural causes, hydrometeorological causes in particular, can be regarded as an excellent initial tool for conducting risk assessment studies, studies on changes in conventional data observations that provide information on the possible impact of climate change, risk prevention studies, etc.

A frequency analysis providing the territorial distribution of each natural cause of loss appears below.

Provinces in which the amount of compensation is greater than or equal to the arithmetic mean of the time series for the territory of Spain as a whole plus one standard deviation appear in red; provinces where it falls within the range of the arithmetic mean plus or minus one standard deviation appear in blue, and provinces where it is less than or equal to the mean less one standard deviation appear in green.

RED	≥ x + 1/5 S
BLUE	= x ± 1/5 S
GREEN	≤ x - 1/5 S

Intra- and interannual variations in rainfall are typical of Mediterranean precipitation patterns, and together with the concentration of rainfall in short spans of time, causes flooding, ordinarily pluvial flooding, that can produce large amounts of damage. After all, Spain's Mediterranean shore is one of the main regions where high daily and hourly precipitation rates are recorded.

The historical data observations on compensation for flooding paid by the CCC in the data series considered paint quite a precise picture of the above-mentioned hydrometeorological features for the eastern and southeastern coast of mainland Spain (Figure 11). Some of the provinces most prone to flooding are Alicante, Valencia, Murcia, Málaga, and Barcelona, where indemnities for flooding have totalled 475, 423, 398, 328, and 316 million euros, respectively, over the past 25 years. These provinces and the rest of the provinces along Spain's Mediterranean coastal strip make up the geographic region that is most prone to torrential rains and is most highly exposed to abundant rainfall events in short spans of time. Frequencies higher than the national average have also been recorded in other regions near the Bay of Biscay in the north and the Lower Guadalquivir region in the south. Madrid too has higher average values, though this is quite likely an effect of exposure.

The distribution of compensation paid for earthquake by province reveals the enormous impact of the Lorca earthquake, with the indemnities paid for that single loss amounting to 522 million euros (95 % of the total). Given the low frequency of this phenomenon, it is hard to make projections based on the CCS's claims database, though the regions with the highest seismic risk can be placed in southeastern Spain, and to a lesser extent in the Pyrenees and Galicia. Besides Murcia, Melilla, Lugo, and Ciudad Real also stand out, with compensation values of 8, 2, and 1 million euros over the time series considered.

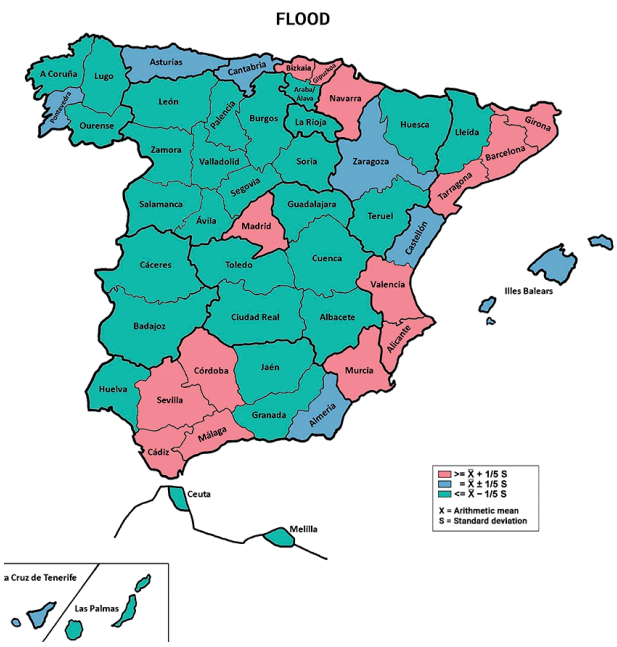


Figure 11. Distribution of property damage from flooding in relation to the national average by province.

Figure 12. Distribution of property damage from earthquake in relation to the national average by province.

Wind damage (Figure 13) is concentrated in eastern and northwestern Spain and along the Bay of Biscay. As a rule, there are two reasons for this. In northern and northwestern Spain, heavy storms and cyclones pass through or nearby, whereas in the Mediterranean region the reason is phenomena associated with deep convection, such as mesoscale convective systems or even tornadoes. Wind damage is also higher than the average in the Canary Islands, especially in the province of Santa Cruz de Tenerife. The cause can be traced to active cyclones that pass through, some tropical cyclones like tropical storm (and TCA) Delta that hit the archipelago in 2005.

The distribution of losses from man-made causes by province are attributable to socio-political reasons. For terrorism, since a substantial portion of the time period considered in this study of the past 25 years spanned the decline of ETA and the end to its activities, the period considered here in Figure 14 for purposes of graphically representing the distribution of property damage by province has been enlarged to cover the last 49 years (1971-2019). It should also be noted that some of the most eventful and painful terrorist attacks in recent years, perpetrated by Islamic terrorists, have been designed specifically to cause the greatest possible harm to persons, and in consequence they have had hardly any impact at all on this section, which focuses on property damage.

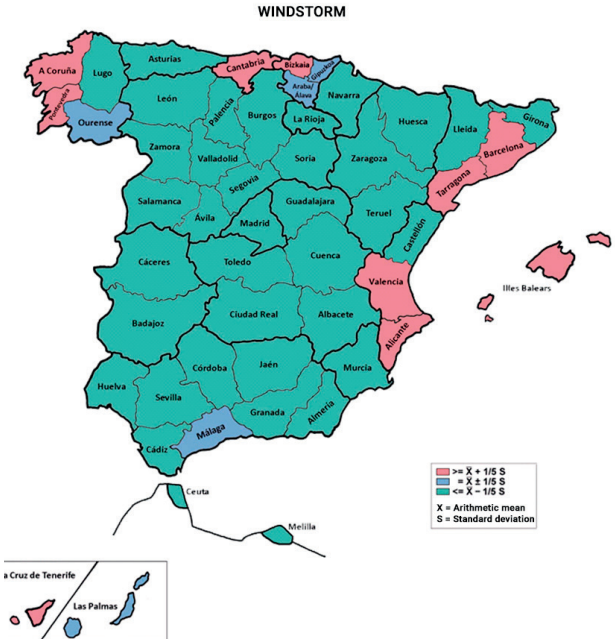


Figure 13. Distribution of property damage from wind in relation to the national average by province.

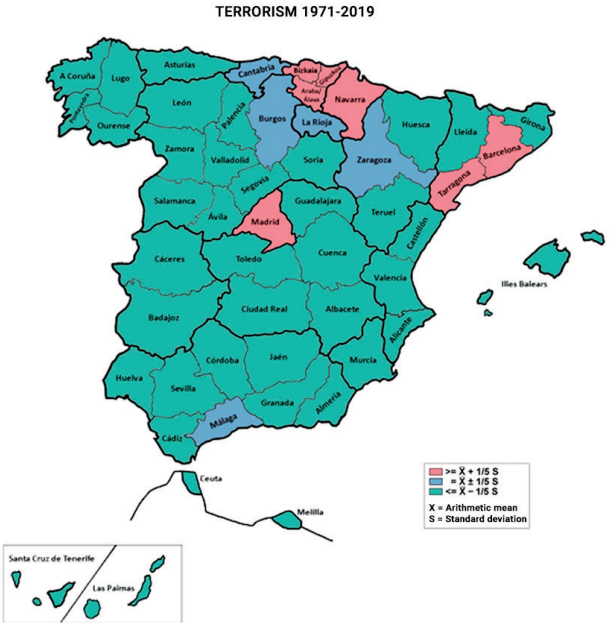


Figure 14. Distribution of property damage from terrorism in relation to the national average by province (for the period 1971-2019).

Figure 15 shows maps for riots, civil commotion, and damage caused by the armed forces and law enforcement in peacetime. Indemnities for this type of man-made damage has accounted for 20 % of the compensation paid over this time series.

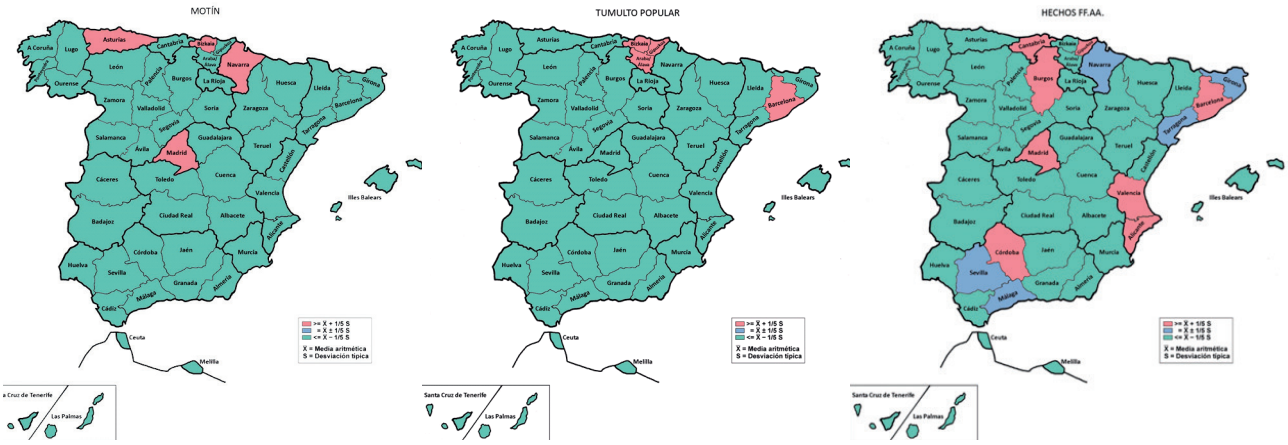


Figure 15. Distribution of property damage from other man-made causes (from left to right, riot, civil commotion and armed forces-related) in relation to the national average by province (1995-2019).

2. PROPERTY DAMAGE, BUSINESS INTERRUPTION, AND PERSONAL INJURY

2.1 LOSS RATE BY CAUSE

The extraordinary risk insurance scheme pays compensation not just for property damage but also for business interruption and personal injury. To compare the loss rates for the various types (property damage, business interruption, personal injury), the time series has been shortened to 16 years (2004-2019), because the CCS began covering business interruption in 2004.

Table 5 summarises the main figures for these three lines of insurance. Damage from natural causes, both property damage and business interruption, is the source of most of the compensation paid out by the CCS, 98 % and 97 %, respectively (at 5,258 and 160 million euros, respectively). In both cases flooding is the natural cause responsible for the most damage (3,511 and 106 million euros, respectively, that is, 65 % and 64 % of the total for all causes).

TIME SERIES 2004-2019	PROPERTY DAMAGE			PERSONAL INJURY			BUSINESS INTERRUPTION		
	No. of claims processed	Indemnities	% Indemnities	No. of claims processed	Indemnities	% Indemnities	No. of claims processed	Indemnities	% Indemnities
FLOOD	490,459	3,511	65%	141	4	5%	4,715	106	64%
EARTHQUAKE	32,611	525	10%	68	2	3%	2,742	18	11%
WINDSTORM	590,673	1,222	23%	22	1	1%	412	36	22%
TOTAL NATURAL CAUSES	**1,113,743**	**5,258**	**98%**	**231**	**7**	**9%**	**7,869**	**160**	**97%**
TERRORISM	5,223	116	2%	3,399	66	91%	98	5	3%
RIOTS	6	0	0%	-	-	0%	-	-	0%
CIVIL COMMOTION	1,695	16	0%	6	0	0%	2	0	0%
ARMED FORCES	1,322	2	0%	3	0	0%	3	0	0%
TOTAL MAN-MADE CAUSES	8,246	134	**2%**	3,408	66	**91%**	103	5	**3%**
TOTAL	**1,121,989**	**5,392**	**100%**	**3,639**	**73**	**100%**	**7,972**	**165**	**100%**

Table 5. Number of claims, compensation (in millions of 2019 euros), and percentage compensation for the property damage, personal injury, and business interruption lines of insurance over the period 2004-2019.

Windstorm also ranks second for compensation paid both for property damage and for business interruption, at 23 % and 22 %, respectively, of the total from man-made and natural causes.

By contrast, man-made causes are mainly responsible for compensation payments for personal injury, accounting for 91 % of the total from both natural and man-made causes (66 million euros). Terrorism is the cause responsible for the most compensation (65.98 million euros).

The high number of claims for personal injury caused by terrorism processed over the time series considered was due mainly (2,895 claims processed) to the terrorist attacks of 11 March and 3 April 2004 in Madrid and Leganés, respectively.

2.2 LOSS RATE BY THE MOST SIGNIFICANT EVENTS IN THE SERIES

Table 6 considers the events for which the most compensation has been paid over the time series for 1995-2019, namely:

- Storm Klaus, on 23 January 2009 and following days.
- The Lorca earthquake, on 11 May 2011.
- Flooding in southeastern Spain on 11-15 September 2019.

EVENT	Line of insurance	Claim No	Loss	% Loss
Windstorm Klaus	PERSONAL INJURY	7	0.2	0%
From 23 Jan 2009	BUSINESS INTERRUP.	167	10	2%
All over Spain	PROPERTY LOSS	265,069	557	98%
TOTAL EVENT		265,243	567	100%
Lorca Earthquake	PERSONAL INJURY	9	0.2	0%
11/05/2011	BUSINESS INTERRUP.	2,728	18	3%
Murcia Region	PROPERTY LOSS	25,306	503	97%
TOTAL EVENT		28,043	522	100%
Flood	PERSONAL INJURY	5	0.2	0%
11-15 Sep 2019	BUSINESS INTERRUP.	412	7	2%
SE Iberian Peninsula	PROPERTY LOSS	56,135	472	98%
TOTAL EVENT		56,552	480	100%

Loss in million € as of 31 Dec 2019.
Table 6. Details of the three main events over the period 1995-2019.

For all the events, property damage accounted for the bulk of the compensation paid, 98 % for both Storm Klaus and the flooding in southeastern Spain and 97 % for the Lorca earthquake.

3. PROPERTY DAMAGE: PREMIUM CONSUMPTION AND LOSS FREQUENCY

Figure 16 plots compensation paid out and surcharges collected for all the perils covered by the CCS for property damage, the main cover in terms of both volume of compensation and volume of surcharges.

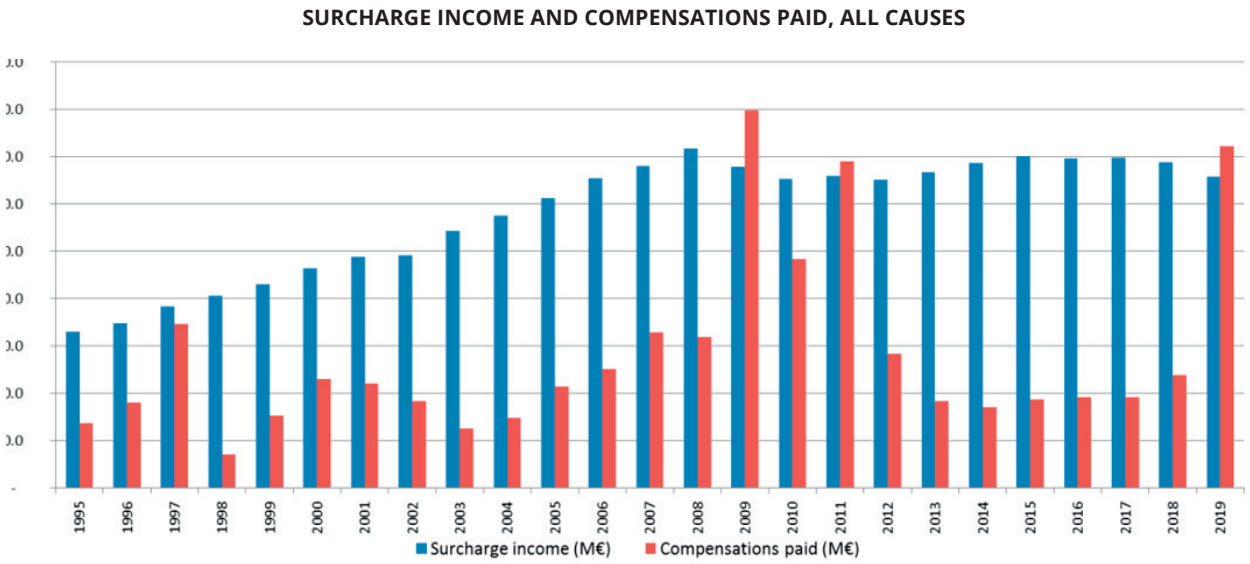


Figure 16. Surcharges accrued and compensation paid for the period 1995-2019.

Looking at the chart, we can see that for the time series considered here, compensation paid out exceeded surcharges collected for all causes covered by the CCS (natural causes and man-made causes) only in 2009, 2011, and 2019. Premium consumption was thus greater than 100 %, namely, 118 %, 105 %, and 119 %, respectively, in 2009, 2011, and 2019. Including premium accruals and all loss components (incurred but not reported provisions, expenses charged to benefits, net operating costs, and other technical and operating costs) in the premium consumption calculation would yield higher combined ratio values.

The higher consumption can be explained to a large extent because the most significant events over the time period considered took place in those three years, namely, Storm Klaus in 2009, the Lorca earthquake in May 2011, and flooding in southeastern Spain in September 2019.

Finally, the sample in Table 7 has been rounded out by taking what we have called frequency, measured as the ratio of compensation to sums insured, expressed in per mille, in addition to premium consumption.

The sums insured values were collected from the statistical data sheets with data on policies subject to CCS surcharges issued or renewed in each year reported to the CCS by insurance companies annually up to and including 2018. For 2019, the data were collected from the data files submitted by insurance companies monthly during the year to report surcharges and surcharge payments.

The surcharges accruing were those published in the CCS's annual reports without discounting the collection fee (5 %) kept by insurers to cover management costs. The sums collected were for all causes covered by the CCS's extraordinary risk insurance scheme, both natural and man-made.

LOSS FREQUENCY AND LOSS RATIO BY CAUSE

Amounts in M€ as of 31 Dec 2019

YEAR	INSURED CAPITAL	SURCHARGE INCOME	NAT CAT			MAN MADE			ALL CAUSES		
			LOSS	LOSS RATIO (%)	FREQUENCY (‰)	LOSS	LOSS RATIO (%)	FREQUENCY (‰)	LOSS	LOSS RATIO (%)	FREQUENCY (‰)
1995	2,023,201	330	119	36	0.06	17.1	5.2	0.0084	136	41	0.07
1996	2,141,876	348	152	44	0.07	27.3	7.9	0.0128	179	51	0.08
1997	2,357,405	382	317	83	0.13	28.8	7.5	0.0122	346	90	0.15
1998	2,645,504	406	58	14	0.02	12.0	3.0	0.0045	70	17	0.03
1999	2,738,961	430	142	33	0.05	9.8	2.3	0.0036	152	35	0.06
2000	2,758,752	463	198	43	0.07	32.5	7.0	0.0118	230	50	0.08
2001	3,024,935	487	183	38	0.06	36.4	7.5	0.0120	219	45	0.07
2002	3,154,857	492	155	32	0.05	27.3	5.6	0.0087	183	37	0.06
2003	3,489,857	543	121	22	0.03	4.0	0.7	0.0012	125	23	0.04
2004	3,757,065	575	142	25	0.04	5.1	0.9	0.0014	147	26	0.04
2005	3,952,721	612	204	33	0.05	9.1	1.5	0.0023	213	35	0.05
2006	4,354,200	654	195	30	0.04	54.8	8.4	0.0126	250	38	0.06
2007	4,555,620	679	321	47	0.07	7.0	1.0	0.0015	328	48	0.07
2008	4,726,955	717	289	40	0.06	29.6	4.1	0.0063	319	44	0.07
2009	5,018,012	678	783	116	0.16	14.3	2.1	0.0028	797	118	0.16
2010	5,171,697	652	482	74	0.09	0.9	0.1	0.0002	483	74	0.09
2011	5,264,903	658	690	105	0.13	0.4	0.1	0.0001	690	105	0.13
2012	5,276,746	651	283	43	0.05	0.5	0.1	0.0001	283	44	0.05
2013	5,111,952	667	182	27	0.04	0.8	0.1	0.0002	183	27	0.04
2014	5,246,195	686	168	25	0.03	2.1	0.3	0.0004	171	25	0.03
2015	5,437,049	701	185	26	0.03	1.3	0.2	0.0002	186	27	0.03
2016	5,518,965	696	190	27	0.03	0.4	0.1	0.0001	190	27	0.03
2017	5,708,621	698	191	27	0.03	0.5	0.1	0.0001	191	27	0.03
2018	5,721,178	687	238	35	0.04	0.4	0.1	0.0001	238	35	0.04
2019	5,810,374	656	714	109	0.12	7.1	1.1	0.0012	721	110	0.12
TOTAL	104,967,601	14,546	6,702	46 %	0.06	329	2 %	0.0031	7,031	48 %	0.07

Table 7. Time series for exposure and loss rates, 1995-2019.

The Table reveals a rising trend in sums insured since the start of the time series. Sums insured have risen by 187 % from 1995 to 2019. Surcharges accruing have also followed a rising trend, though less marked, chiefly because of changes in the extraordinary risk surcharge rates. Surcharges have risen by 99 % from 1995 to 2019.

As we will see below, the same is not the case to the same extent for compensation paid out by the CCS.

Figure 17 plots property damage, loss rates, surcharges, and capital exposure for all causes over the time series considered.

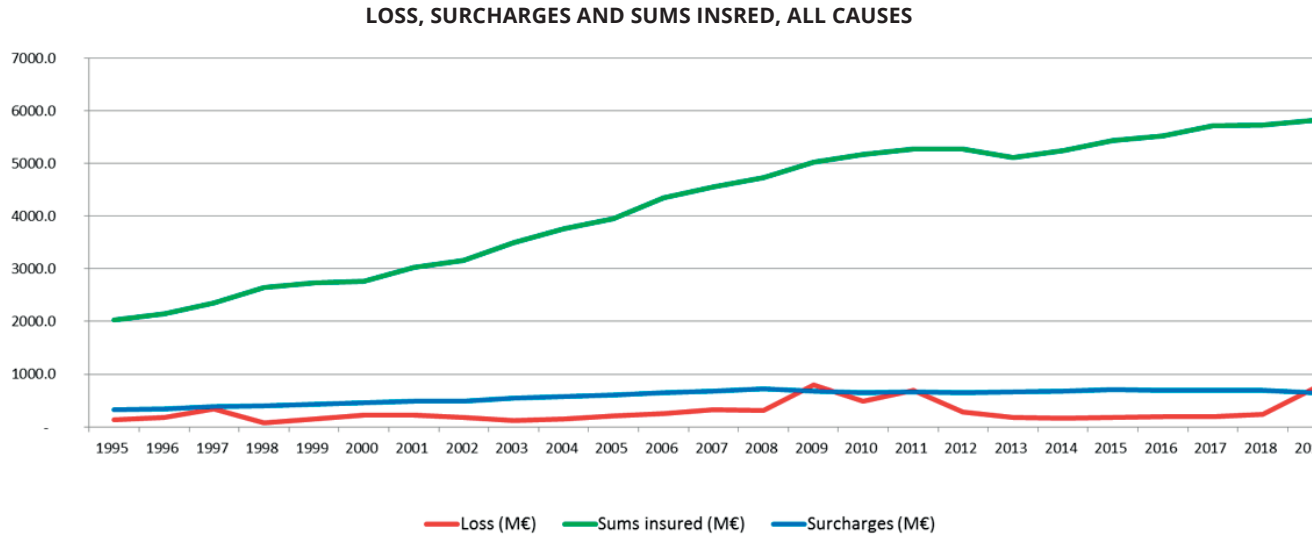


Figure 17. Trends for capital exposure, surcharges, and loss rates over the period 1995-2019.

Coverage of extraordinary risks by the CCS has proven to be a necessary system in view of the aggregated capital exposure and the variable behaviour of losses, a feature intrinsic to the perils covered, which calls for making provisions for compensation over time, i.e., the equalisation reserve held by the CCS. It has also proven to be both effective, in that the national government has not had to pay in any contributions, as permitted by law should available funds be insufficient, and efficient, capable of flattening surcharges despite increased exposure and hence risk.

Improving the assessments of real costs of disasters

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Economic losses caused by natural disasters are increasing worldwide

Although natural hazards do not necessarily have to become natural disasters, the economic losses caused by natural disasters are increasing worldwide no matter whether these are caused by geophysical, meteorological, hydrological or climatological hazards. Natural hazards become disasters when lives are lost, when buildings and infrastructures are damaged, and when the financial and social costs of dealing with reconstruction and complete recovery, lasting years or even decades, can hardly be afforded.

The estimates of the comprehensive costs of disasters are necessary to analyse the benefits of past and future risk management policies. This information is helpful to inform decision making and to develop cost effective strategies and measures to prevent or reduce the negative impacts of disasters and threats.

By creating and building resilience[1], natural disasters can be avoided, if not completely at least in part, by mitigating their effects and allowing to recover more quickly.

During the United Nations 2015 World Conference, States reiterated their commitment to address disaster risk reduction and the building of resilience to disasters, and the Sendai Framework for Disaster Risk Reduction, SFDRR, 2015-2030 (UN, 2015)[2] was adopted. The SFDRR aims to achieve the substantial reduction of disaster risk and losses by 2030 setting seven global targets and four priority areas for action.

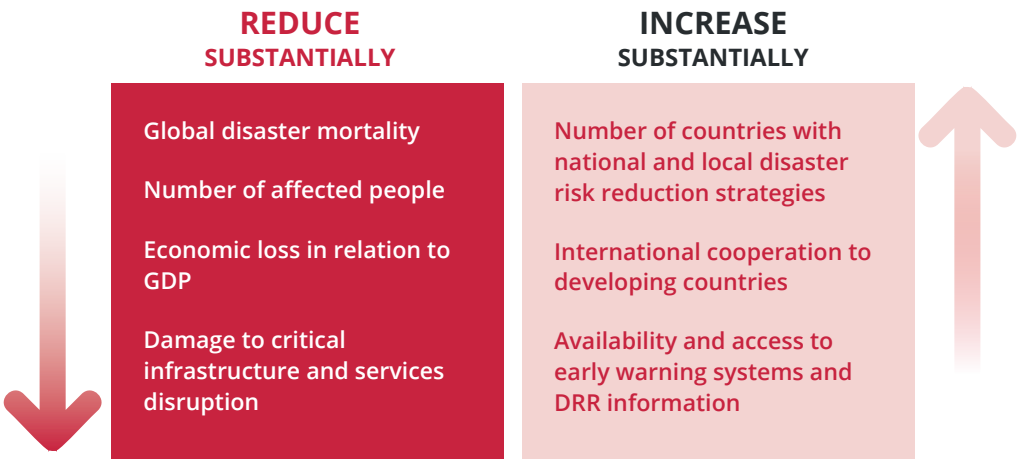


Figure 1. UN Sendai Framework seven global targets to be achieved by 2030.

(1) Resilience is defined as the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of essential basic structures and functions through risk management (UNISDR, 2017).
(2) UNISDR, 2015, *Sendai Framework for Disaster Risk Reduction 2015-2030*, UN Report UNISDR/GE/015, Geneva, Switzerland.

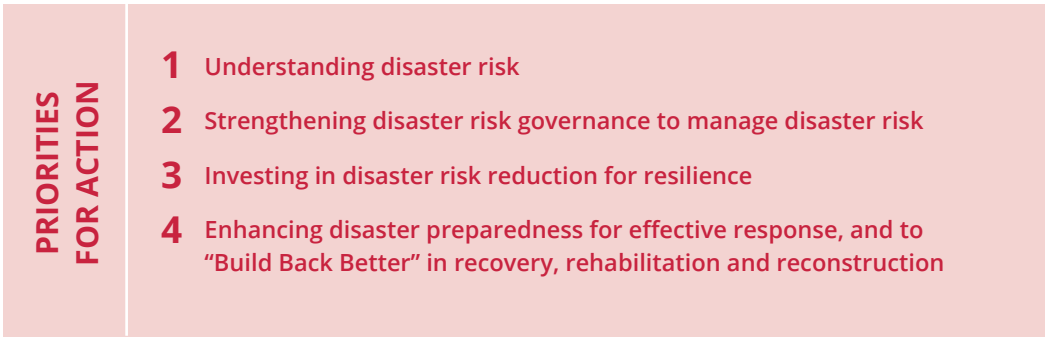


Figure 2. SFDRR priorities areas for action.

Disaster Risk Reduction and Climate Change Adaptation are as well integrated in key European Union policies and strategies. Among them, the EU Action Plan on SFDRR 2015-2030 (EC, 2016)[3] recognizes the Sendai framework as an opportunity to advance the DRM agenda in Europe and to reinforce resilience. As part of its implementation, the European Commission aims to build disaster risk knowledge across all EU policies with the aim of providing a better understanding of disaster risks and to contribute to a disaster informed approach to EU emergency management and other relevant policies.

Key in the strategy is ***to move from disaster management to disaster risk management*** in order to reduce and prevent new disaster risks. Under the SFDRR first objective ***"Understanding Disaster Risks"***, the Sendai framework addresses ***data, risk and vulnerability assessment, and the sharing of good practices***. Risk informed policies are based on the undertaking of risk assessments, a better collection of loss and damage disaster data, and a strengthen engagement with the scientific community.

The Sendai Framework highlights the importance of collecting data regarding damages and losses occasioned by disasters. The **need for damages and loss data collection** contributes both to the effectiveness of DRR policies and strategies, as well as to the improvement of risk assessment models.

Need for damages and loss data collection

Disaster loss data recording is the result of a systematic, consistent, coordinated process to collect human, physical, and economic losses as well as social and environmental consequences immediately following an emergency or a disaster. Although this practice has been mostly associated to compensation schemes, it results in crucial and unique evidence regarding risk trends, exposure, vulnerability, coping capacity, mitigation and response to the disaster and at the same time is essential for improving risk models.

At EU level, responding to the wide number of policies using and depending on loss data — disaster loss accounting and compensation, disaster forensics, and feeding risk modelling — **is challenging**. A harmonized collection of disaster and damage loss data analysis is recognized as key to improve Disaster Risk Management and to increase resilience to disasters across the territory of the EU.

The current practice in disaster loss data recording and collection across the EU collection is very heterogeneous among member states, with available loss databases varying in their level of completeness and detail, and IT systems varying in their purpose, complexity and openness. The lack of standards for damage and loss data collection and recoding represents a challenge for sharing or comparing data within EU.

(3) EC, 2016, Commission staff working document — Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030: A disaster risk-informed approach for all EU policies, COM (2016) 739 final.

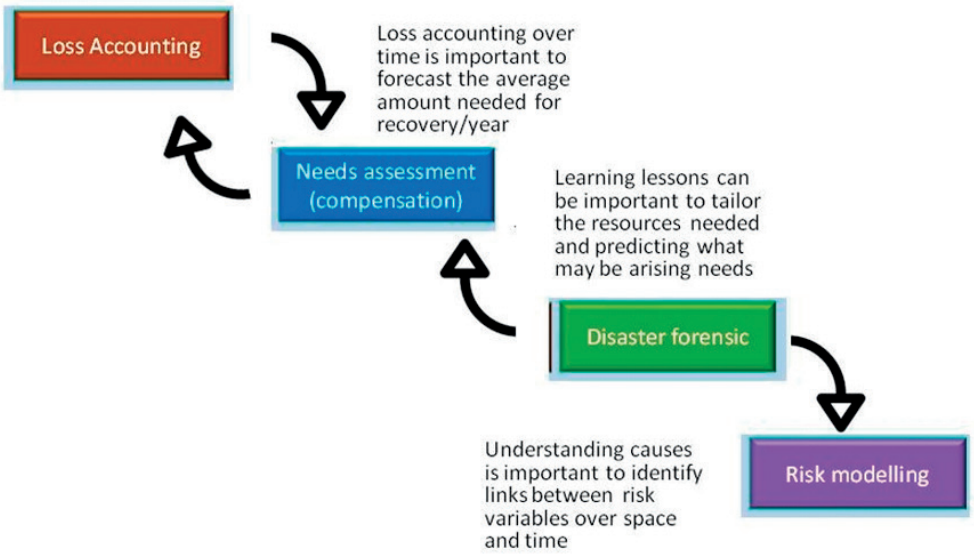


Figure 3. Four main application areas of disaster loss databases.

In a recent communication, the European Commission[4] calls Member States to promote more systematic collection and dissemination of loss data to enhance the collection of loss data and to make use of loss data for optimised prevention and climate adaptation planning.

Disaster damage and loss data are collected by many countries, but information is not always centralized in one national database. Different institutions, from national to municipal level, are active in the collection of data of disasters. There is also a need for sharing data collected by non-governmental agencies such as data on insured losses which are often more comprehensive and systematically recorded and which can provide a basis for estimating overall economic losses. **The estimates of the comprehensive costs of disasters are necessary to analyse the benefits of past and future risk management policies.** This information is helpful to inform decision making and to develop cost effective strategies and measures to prevent or reduce the negative impacts of disasters and threats.

The role of knowledge and data in supporting disaster risk reduction

Evidence-based, effective and efficient disaster risk reduction (DRR) and climate change adaptation (CCA) assessments, policies and strategies require knowledge and data.

Although it is usually the case that few days after a disaster the media are ready to provide aggregate numbers regarding victims and overall compensation needs, such numbers are rarely verified or verifiable, and long after the event damage estimations are still affected by large uncertainties. Current practices in damage assessment for compensation do not contribute to analysing the damage drivers and very little or no effort is put in on decision making in what regards resilience as based on lessons learnt from the occurred event. For this reason, a large effort has been made by different levels of governance, and international and European institutions to improve the situation and provide a more solid basis for any evaluation of trends, accounting or assessment of damage over time and across different geographic areas.

(4) Communication from the Commission to the European Parliament, the Council and the Committee of the Regions, 'Strengthening EU disaster management: rescEU — solidarity with responsibility', COM (2017) 773 final, Brussels, 23.11.2017.

SFDRR Priority 1, "Understanding risk", implies improving disaster data at all levels, starting from global and going down to national and local and back the other way round.

Within the EU, the JRC[5] instituted the Disaster Risk Management Knowledge centre (DRMKC) in 2015, to help enhance EU and Member States resilience to disasters and their capacity to prevent, prepare and respond to emergencies through a strengthened interface between science and policy. The Disaster Risk Management Knowledge Centre pursues three main pillars: **knowledge, innovation, and partnership**.

Improving damage data quality leads to improved risk mitigation measures in three aspects. First, better knowledge of damage losses can improve program resources to cope with risk and if possible to avoid it. By understanding better the causes of damage — including also man-made arising from excessive exposure in hazardous areas and high levels of vulnerability — better addressing reconstruction decisions can be taken, and lessons to help to mitigate risks in similar areas are revealed. Finally, by calibrating and verifying the models and testing damage scenarios, forecast outputs based on improved damage data against observed damage.

Two DG-ECHO projects aiming at improving management of knowledge and data on damage and losses caused by natural and man-made hazards as an input for disaster risk reduction policies and strategies are IDEA (2015-2016) and LODE (ongoing at present). Both projects have involved case studies in Spain in which the CSIC group has participated in close cooperation with stakeholders such as CCS[6] who has provide invaluable loss and damage data at different development stages in both projects.

The IDEA Project (Improving Damage assessments to Enhance cost-benefit Analysis)

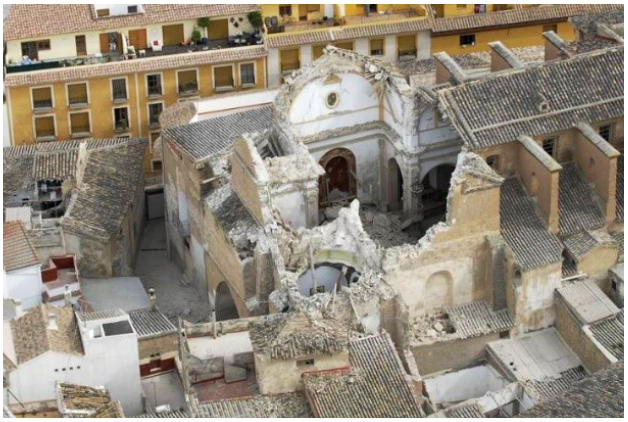
The IDEA project aimed[7] at developing **enhanced methods and tools for the collection, analysis and use of disaster loss data for multiple purposes.** Five partners from three European countries participated in the project: the MNCN[8]/CSIC[9] (Agencia Estatal Consejo Superior de Investigaciones Científicas) and the Catalunya Civil Protection in Spain, the Oxford Brooks University in the UK, the Umbria Region Civil Protection and the coordinating Politecnico di Milano in Italy. Four case studies were identified: floods in the River Severn Basin in the UK in 2007, in the Umbria Region (Italy) in 2012, 2013 and 2014, and in the Vall d'Aran valley in Catalunya (Spain) in 2013, and the Lorca (Spain) earthquake in 2011.

In the context of the project, several meetings and interviews with stakeholders from different private organisations, in particular insurance and lifeline companies, and public administrations were carried out. Also, two international workshops were organized to share the results achieved at each stage of the project with a large audience of different stakeholders, pertaining also to the business sector.

IDEA conducted a number of verification tests investigating in depth real events to compare with the ex-ante estimations that could have been done or that were done based on the information available at the time on existing hazards, exposure levels and vulnerability conditions.

(5) Joint Research Center.
(6) CCS: Consorcio Compensación Seguros.
(7) IDEA project funded by the European Commission – DG ECHO – Directorate General for European Civil protection and Humanitarian Aid Operations under the Program: Union Civil Protection Mechanism Prevention and Preparedness 2016-2018. http://www.ideaproject.polimi.it/
(8) MNCN Museo Nacional Ciencias Naturales.
(9) CSIC Consejo Superior Investigaciones Científicas.

Floods in Vall d'Aran in Catalunya in 2013.



Earthquake in Lorca, Murcia, in 2011.

Figure 4: IDEA Case studies in Spain.

The results of IDEA have contributed to the three pillars pursued by the DRKMC, i.e. **knowledge, innovation, and partnership** as detailed in what follows.

While all focus and attention is generally devoted to **scientific knowledge, regulatory and organizational knowledge are equally important for risk governance**. To substantially improve the way post disaster data are collected and managed, it is essential that the three types of knowledge mentioned above are integrated combining their interpretation and understanding of disasters and recovery needs. Different types of knowledge are "owned" primarily, but not exclusively, by different stakeholders: researchers are more prominent in scientific knowledge, public officers and insurers are more knowledgeable about legislative and organizational knowledge. Sharing of the information held by different stakeholders is key to the advancement in post disaster damage understanding and accounting capacity.

An important challenge regarding data collection **is to obtain a systemic perspective on the damage** to multiple sectors that may be differently affected in different events, given the specific conditions of exposure, vulnerability and the exact event scenario that has occurred. In fact, a flood or an earthquake may affect a very large rural area or an industrial zone with very different consequences in terms of lost machinery, type of products, revenue sources, etc. The systemic approach to damage allows to consider the interdependencies and interrelations among sectors leading to indirect damage, determined by ripple, cascading, and enchained effects. Two other important key aspects in any damage data collection and analysis that are often overlooked are **the time and the spatial scale**. Not all damage appears immediately after the event. Part of damage, especially that indirect, due to ripple effects across systems may become manifest only some time later, even weeks or months after the event. **Data collection should be an iterative process** that requires at least a couple of cycles to be accomplished in a satisfactory way. The spatial scale is very relevant in the selection of the most appropriate geographical/territorial level of analysis. While physical damage to assets or buildings can be surveyed and assessed at the local scale, systemic damage producing malfunction to critical infrastructures is often only visible at a larger scale.

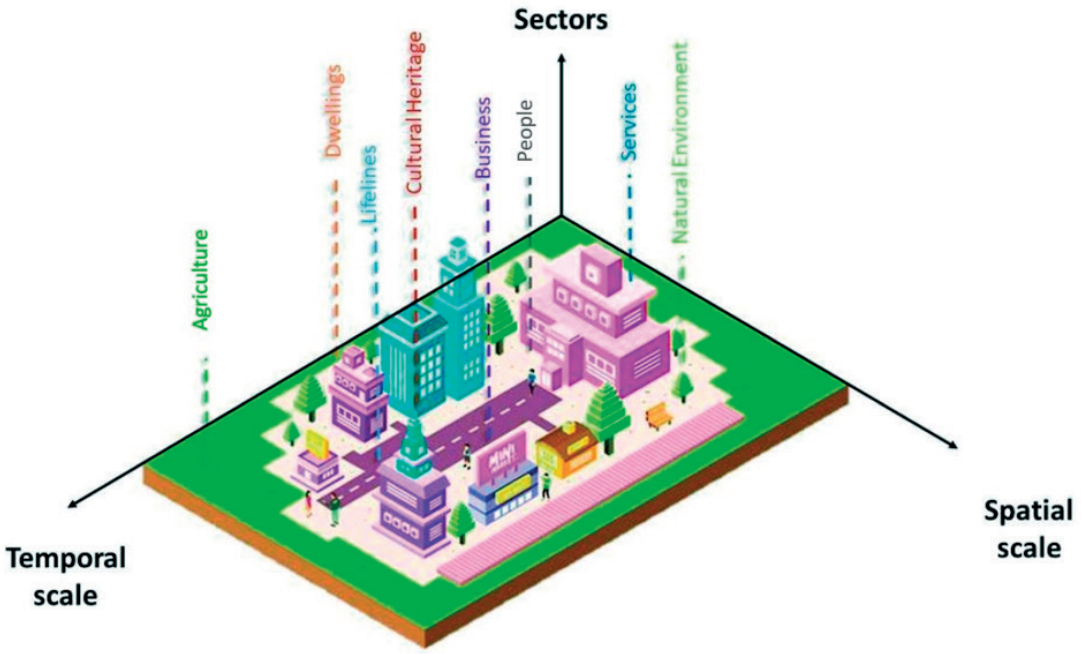


Figure 5. Sectors for which disaster data should be collected.

Innovation on damage data collection is already on the way although a number of issues require further efforts in two aspects: **processes and the use of technologies**. Procedures in data collection and management require improvements in terms of quality and reliability. A **key aspect is the coordination of data across stakeholders**, i.e. between private and public organizations, and within public administrations between different levels of government and different offices and departments of the same governmental organization.

Although modern IT systems allow for a much better and faster data management, **without knowledge on why and how** different **stakeholders collect data** and for what purposes and how such data will be used later for a variety of purposes, **it is virtually impossible to design a system that will be useful and usable**. This was clearly evidenced by the work conducted within IDEA. Equally important is the required level of interaction. Without an adequate level of understanding of the purposes, the assumptions, and the real context in which crisis and therefore damage data are collected, there will be no advancement with respect to the highly fragmented present situation. As a result of the **quite complex understanding of the need for reconciling different interpretations and understanding of damage, IDEA has proposed an IT architecture** with the damage at its core, intended as physical direct effect of the event, as systemic consequence, and as economic loss.

The third pillar DRMKC pursues is partnership, so that complex science can be exploited and translated into useful policy and applications for DRR. As mentioned above, partnership among different stakeholders needs to start from the recognition of the relevance of different types of knowledge that stakeholders may possess in a more or less prominent way. The level of complexity that current research in environmental and societal domains acknowledges can avoid taking risky easy solutions, which might imply worsening the situation through unexpected side effects. It is as well equally important that scientists are informed on what can be qualified as useful and usable knowledge according to the existing organizational and legislative frameworks. **Key relevant knowledge** to share among different stakeholders is that related to a) **specific needs in terms of data collection and analysis**, b) **whether or not enhanced capacity to develop comprehensive damage scenarios can constitute an advantage** for each stakeholder in their work practices.

From the experience gained in IDEA, but also in former research projects, some stakeholders are very open in sharing their data while others are still quite reluctant to do so. Changes can be perceived particularly in the

insurance sector by making available their data, deprived of sensitive components, contributing substantially to gain insight into the damage caused by natural hazards. Obstacles still exist in lifeline managing companies on sharing their data most probably related to the ownership of the network (public versus private) and the requirements for security. In some cases, deeply rooted traditionally data protective culture in enterprises might be another reason for not sharing data.

Within IDEA, fruitful partnership was established between MNCN/CSIC and CCS regarding Lorca 2011 earthquake case study by exchanging and sharing information on damage and losses. This allowed to identifying the distribution of insured losses provided by CCS and non-insured losses collected by CSIC among the different sectors. Based on 2016 data, the CCS compensations contributed to around 44 % of the total costs of losses, 76 % of which corresponds to private housing, 57 % to business and industry sectors, and 9 % to cultural heritage sector.

LODE project: (Loss data Enhancement for DRR and CCA management)

The ongoing LODE project builds on IDEA and prior experience of all partners in collecting, organizing, and using disaster damage and loss data. Ten partners are committed to the project from seven countries, including Italy, Spain, Portugal, France, Greece, Finland, and Serbia and they represent both scientific research centres and universities as well as public administrations that are active in different fields of risk management and mitigation.

The project practical goal is to develop damage and loss data information system (IS) for DRR and CCA to enhance our understanding of disaster impacts to multiple societal sectors at relevant spatial and temporal scales.

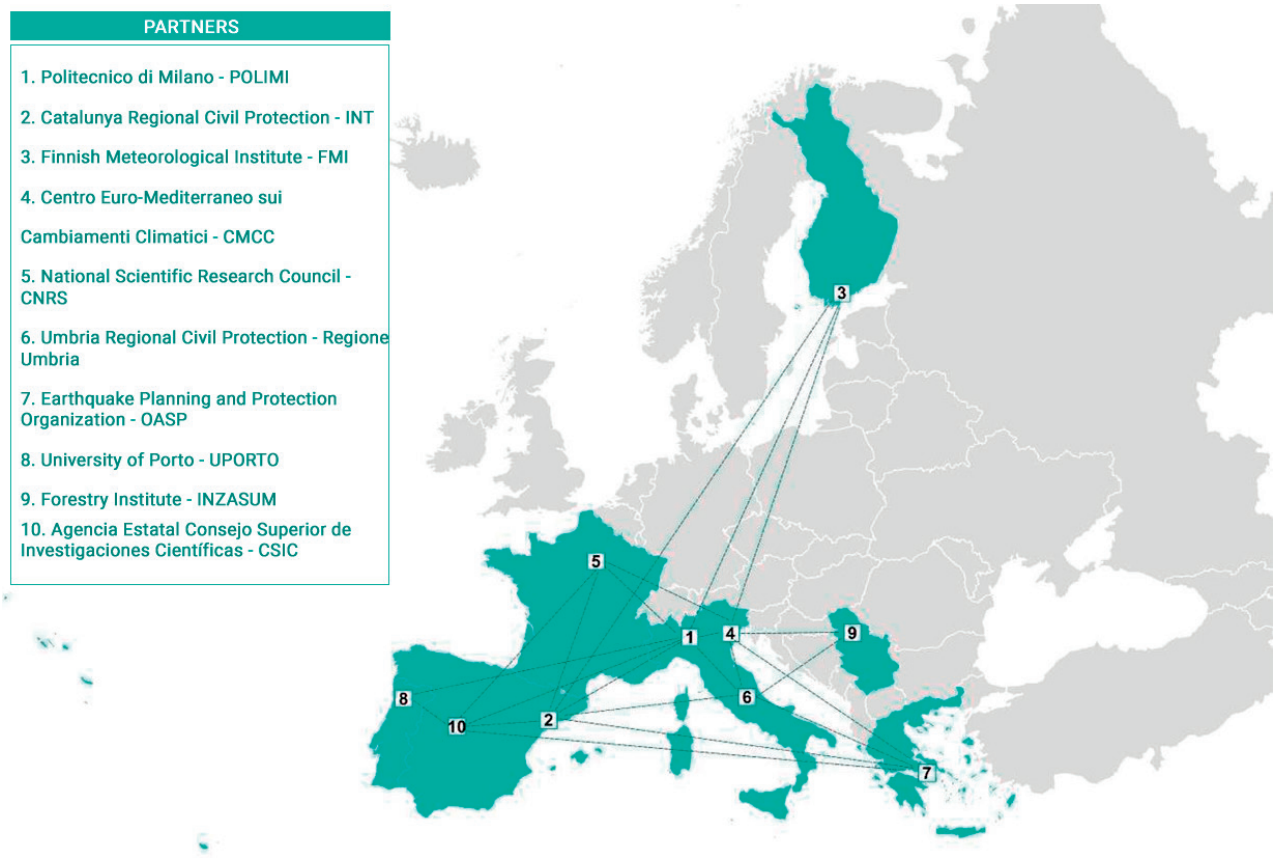


Figure 6. LODE project partners.

The baseline of LODE is a set of ten showcases in all countries of the project's partners where damage data collection, storage and analysis are carried out following the methodology and the approach which is been developed. In each case, one or two types of applications will be carried out in order to show in practice the added value of enhanced damage and loss data and the utilities provided by the information system proposed.

An important aspect in LODE is the network of stakeholders with a twofold role. Stakeholders are contributing in identifying best practice examples and are raising awareness of relevant policy and stakeholder organizations responsible for DRR and CCA in need of better coordinated efforts to develop a multisector and comprehensive picture of damage due to natural hazards.

The showcases range from local to national scale examples of different hazards where relevant impacts were recorded and for which data is available even though not already organised and structured. Some of the showcases will be focusing on one or two sectors that are the object of full IS implementation. The showcases are characterized by the fact that they cover different scales, different hazard types, and different typologies of affected sectors and territories in the countries participating in the action as can be seen in the tables below.

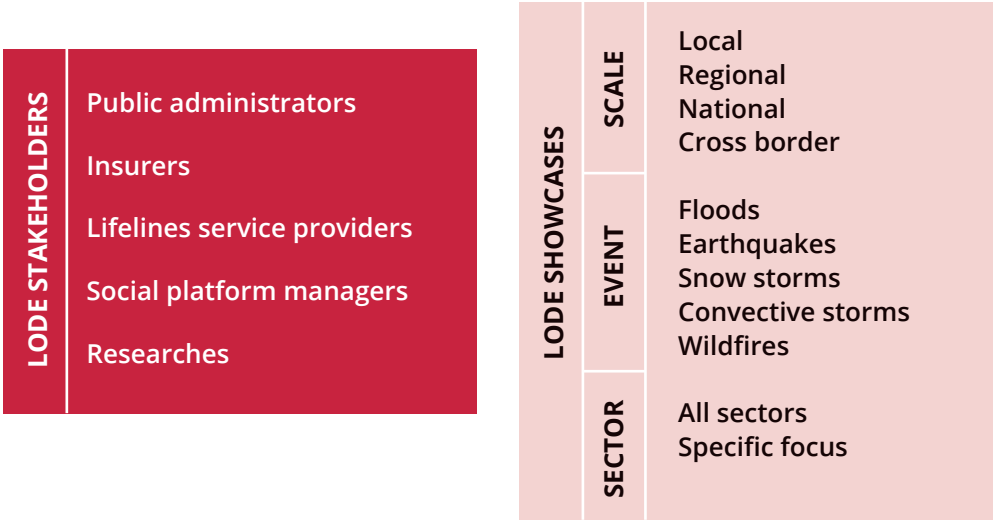


Figure 7. LODE stakeholders and LODE Showcases.

LODE will provide a conceptual and operational information infrastructure and a practical guideline not only to collect but also to manage and use the data for a variety of purposes — centralizing the data — so that various reports and analyses will consistently use the same set of data. The guidelines and the infrastructure system will need to be tested in future events and connected to already existing databases and/or populated with historic data if deemed relevant.

The LODE IT tools will be usable and open to stakeholders. Even though procedural needs will be defined to a certain extent during the project, the latter will need to be translated into operational protocol and regulations by involved stakeholders to enable its use in routine established actions in future events and for structuring also available data related to past events.

The way ahead

Still, the assessments of the costs of disasters, both by measuring the socio-economic impacts and in terms of understanding the cost of reducing or avoiding them, need to be improved. More precise expenditure evaluations in

managing the consequences of disasters will allow decision-makers and stakeholders to evaluate the benefits of allocating resources and investments.

A key aspect still ahead is the need for closer cooperation between government agencies, non-governmental, and private stakeholders to improve the existing evidence base on damages and losses of disasters.

Data on policies and sums insured in 2019 based on the new surcharge reporting system (SIR): prospects for future improvements in the data and scope of reporting

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The regulatory framework for reporting and paying Consorcio de Compensación de Seguros (the CCS or Consorcio) surcharges has remained essentially unchanged since 2004. Recent technological advances impacting the systems that insurance companies use to process and exchange information more efficiently and securely, and their ability to do so, have made it possible to undertake procedural and operational enhancements to the content of reporting and paying surcharges to the Consorcio to enable it to perform its various activities ('extraordinary' risk coverage, insurance company liquidations, and the automobile insurance guaranty fund) and to the information on the perils covered by the CCS.

These enhancements have taken the form of the new surcharge reporting system (abbreviated SIR after the Spanish, "*Sistema de Información de Recargos*") that took effect on 1 January 2019.

The regulatory framework consists of:

- The Decision of 27 March 2018 by the President of the Consorcio de Compensación de Seguros approving reporting forms and electronic payment of surcharges collected by insurance companies [*Resolución de 27 de marzo de 2018, de la Presidencia del Consorcio de Compensación de Seguros por la que se aprueban los modelos de declaración e ingreso por vía electrónica de los recargos recaudados por las entidades aseguradoras*].

The purpose of this paper can be said to be three-fold:

- To present and analyse the data on policies and sums insured for the year 2019 obtained using the SIR.
- To discuss possible improvements that could be effected to increase the quality of the data based on this analysis of the data for the first year under the new system.
- To consider the scope of all these data in future.

- The Decision of 31 October 2018 by the President of the Consorcio de Compensación de Seguros on deadlines and procedures for reporting and paying surcharges collected by insurance companies [*Resolución de 31 de octubre de 2018, de la Presidencia del Consorcio de Compensación de Seguros por la que se establecen los plazos y el procedimiento de declaración e ingreso de los recargos recaudados por las entidades aseguradoras*].

The main objectives of this new system are:

- Reporting to the CCS: (i) the identifying particulars of the policies on which surcharges are charged and (ii) the location of the perils covered.

- Adapting the surcharge reporting and payment system to an updated functional and digital environment with use of proven operational and technical media by insurers in the framework of agreements, secure information exchange, temporal traceability of surcharge reporting and payment, and a streamlined reporting and debit system.

- For companies, bringing on stream technical improvements to facilitate surcharge reporting and payment, e.g., automatic report form generation, and to facilitate direct reporting and clearing of refunds during the policy period.

Using this system, insurance companies supply detailed information on such transaction particulars of their policies as coverage inception and expiry dates, geographic location, sums insured and limits, surcharges, and instalment interest. The SIR therefore represents a milestone in data traceability.

The table below summarises the details reported by insurers:

Policy particulars

. Official company registration number.
. Policy number.
. Post code for peril location.
. Policy effective date.
. Report of issue/collection first instalment/collection each instalment.
. Issue/collection/refund/cancellation date.

Insured sums

. Property damage.
. Property damage limit.
. Personal injury.
. Personal injury limit.
. Credit card travel accident insurance.
. Pecuniary loss.
. Pecuniary loss limit.

Surcharges

. Homes/apt. bldgs. excep. risk (E.R.) surcharge.
. Office E.R. surcharge.
. Other risk E.R. surcharge.
. Automotive vehicle E.R. surcharge.
. Road, highway, pipeline E.R. surcharge.
. Tunnel and mine E.R. surcharge.
. Bridge E.R. surcharge.
. Dam E.R. surcharge.
. Marina E.R. surcharge.
. Other port and harbour and groundwater extraction E.R. surcharge.
. Life E.R. surcharge.
. Credit card accident E.R. surcharge.
. Car accident E.R. surcharge.
. Other accident E.R. surcharge.
. Home PL E.R. surcharge.
. Other PL E.R. surcharge.
. Compulsory car insur./guaranty fund surcharge.
. Liquidation activity surcharge.

Instalment interest

. Property insurance instalment interest.
. Personal injury insurance instalment interest.
. Pecuniary loss instalment interest.
. Compulsory car insurance instalment interest - guaranty fund.
. Liquidation activity instalment interest.

Figure 1. Information reported by insurers using the SIR.

Now that this new surcharge reporting system has been put into context, the purpose of this paper can be said to be three-fold:

- To present and analyse the data on policies and sums insured for the year 2019 obtained using the SIR.

- To discuss possible improvements that could be effected to increase the quality of the data based on this analysis of the data for the first year under the new system.

- To consider the scope of all these data in future.

1. Data on policies and sums insured for 2019 collected using the SIR

Our presentation and analysis of the data will distinguish among extraordinary risk insurance surcharges on property damage, pecuniary loss (business interruption), and personal injury insurance.

The information set out in the following tables concerning the number of policies and sums insured refers to those in effect on 31 December of each year plus term policies issued or renewed during the year, except for 2019, which refers to exposure as of 31 December 2019.

Sums insured are in euros current as of 31 December 2019.

A) Property damage

The **number of policies** for 2019 by risk category using the SIR is:

Number of policies by risk category 2019							
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry**	**Infrastructures**	**Automotive Vehicles**	**Total**
2019	19,628,912	275,397	3,093,766	696,599	139	28,274,846	51,969,659

Figure 2. Number of policies by risk category. Property. 2019.

"Commercial and other simple risks" and "Industrial" apportioned as in 2018.

Let us now compare those data with the data for the previous year, 2018, when the data were taken from statistical data sheets submitted to the CCS by insurers. This will provide a look at the consistency of the information extracted from the SIR.

The data for 2018 are:

Number of policies by risk category 2018							
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry**	**Infrastructures**	**Automotive Vehicles**	**Total**
2018	22,728,386	258,295	1,945,457	438,043	205	28,303,197	53,673,583

Figure 3. Number of policies by risk category. Property. 2018.

We can see that the number of policies reported fell from 53.67 million in 2018 to 51.97 million in 2019. That is, a 3.2 % decrease from one year to the next. The largest decrease was for homes and apartment buildings, which dropped from 22.73 million in 2018 to 19.63 million in 2019.

This being said, we would point out that our conclusion is not that the number of policies taken out decreased from 2018 to 2019 but rather that, firstly, the data have been refined, and the 2019 value of 51.9 million policies identified by insurer and by policy number is considered more reliable; and, secondly, the 2018 data for policies issued or renewed during the year and the 2019 data for policies active on 31 December 2019 are not exact equivalents.

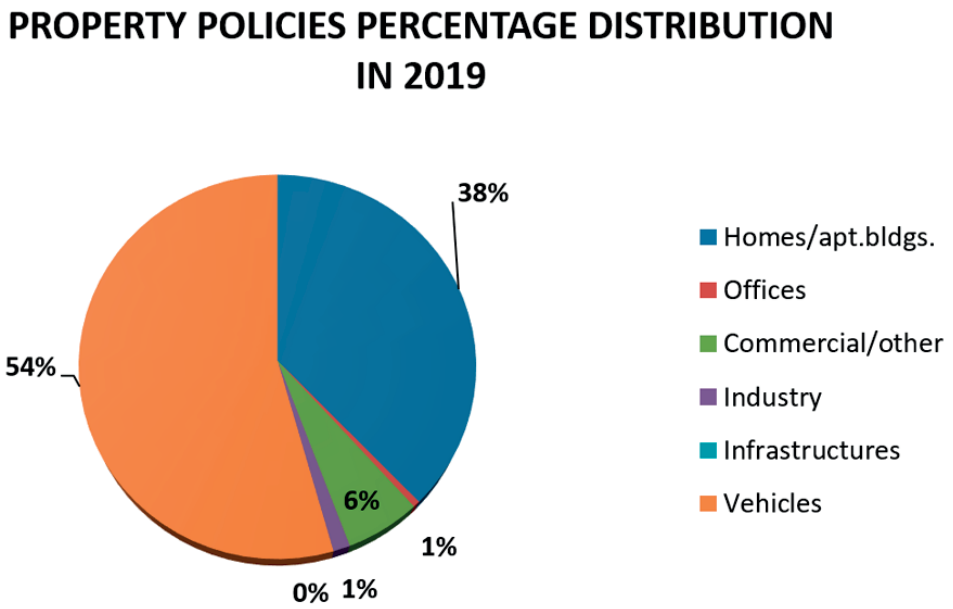

Figure 4. Percentage distribution of policies by risk category. Property. 2019.

We can observe that over half the policies, 54 % of the total, were for motor vehicles. This was followed by homes and apartment buildings, at 38 %.

The time trend for the number of policies over the past 20 years (2000 to 2019) is shown below. Note that through 2018 the data were collected from statistical data sheets submitted to the CCS by insurers while the 2019 data were compiled from the SIR.

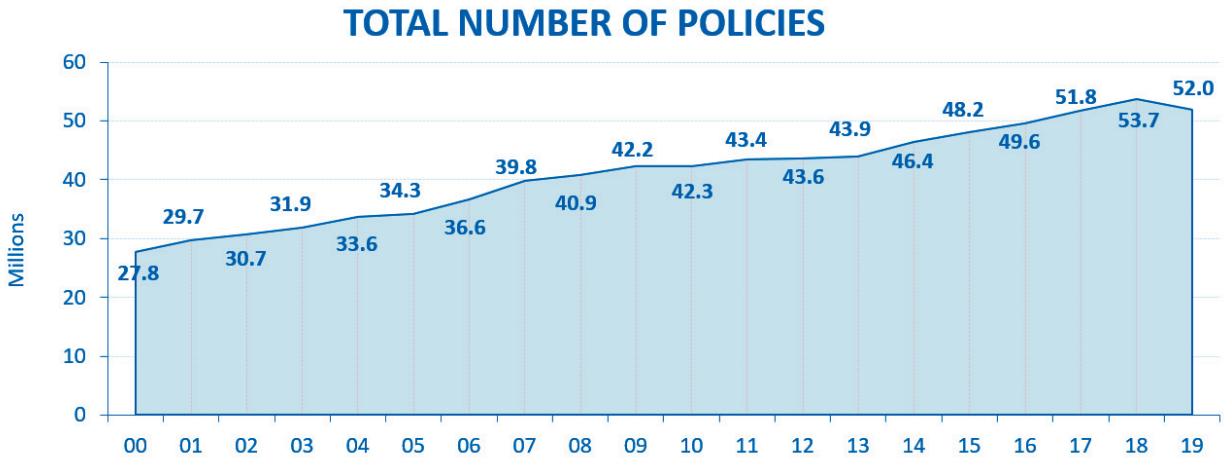

Figure 5. Time trend for the number of policies. Property damage. Time series for 2000-2019.

The number of property policies followed an upward trend over the time series considered, and the 2019 value from the SIR is similar to those for previous years.

The **sums insured** for 2019 by risk category from the SIR data follow:

Sums insured by risk category 2019						
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry**	**Infrastructures**	**Total**
2019	3,737,564,527,445	172,815,296,689	696,330,062,005	1,196,005,763,372	7,658,636,508	5,810.374,286,020

Figure 6. Sums insured by risk category. Property damage. 2019.

"Commercial and other simple risks" and "Industrial" apportioned as in 2018.

The values for sums insured in 2018 were:

Sums insured by risk category 2018						
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry**	**Infrastructures**	**Total**
2018	4,043,626,198,788	104,736,420,637	576,127,983,718	989,548,529,592	7,138,565,609	5,721,177,698,343

Figure 7. Sums insured by risk category. Property damage. 2018.

N.B.: There are no data for the sums insured for motor vehicles, because surcharges are charged as a fixed amount by motor vehicle type, hence that information is not needed to calculate the surcharges, and insurers also do not know the value, because the market value of all motor vehicles in operation is constantly changing. Therefore, the worth of motor vehicles is in addition to the sums insured set forth here.

Sums insured increased by 1.6 % from 2018 to 2019. That value is the meaningful variable, since it determines the surcharges collected by the CCS and its maximum coverage exposure. The increase was recorded for all risk categories except homes and apartment buildings, which decreased, just like the number of homeowner policies.

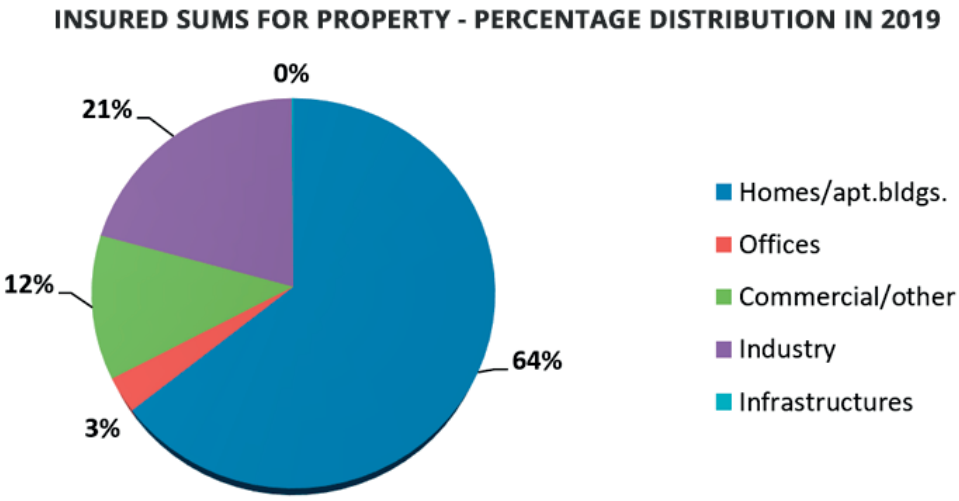

Figure 8. Percentage distribution of sums insured by risk category. Property damage. 2019.

Homes and apartment buildings can be seen to account for 64 % of the total sums insured, followed by industry at 21 % of the total.

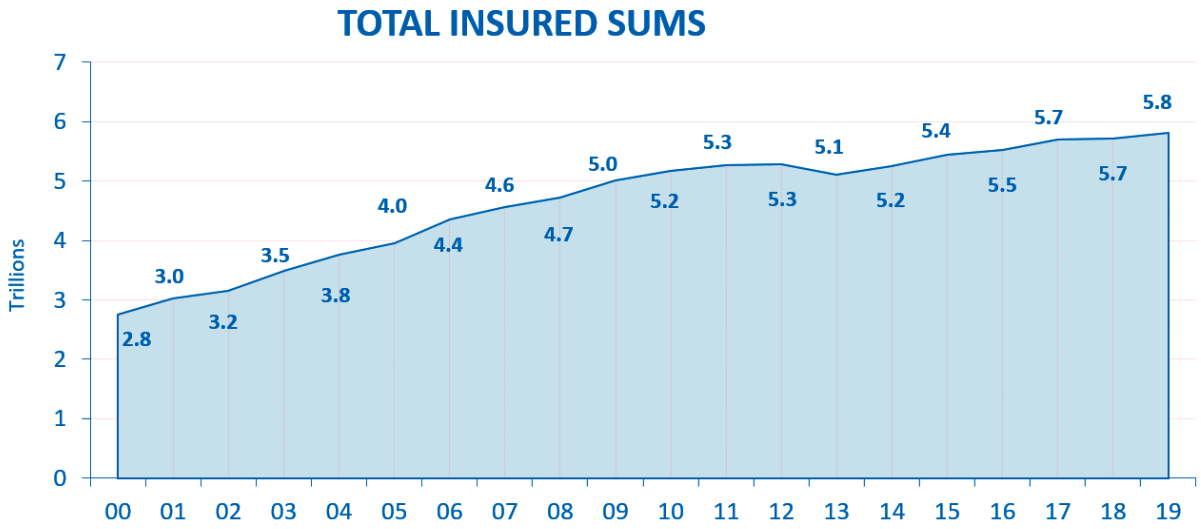

Figure 9. Time trend for sums insured. Property damage. Time series for 2000-2019.

The time trend for sums insured over the past 20 years (2000 to 2019) exhibits a rising trend over the entire period, and the increase recorded for 2019 would appear to be consistent with the values for the series as a whole.

The property data for 2019 compiled from the SIR are summarised below:

Number of policies, sums insured, and mean sums insured by risk category 2019					
Risk Category	Nº of Policies	%	Sums Insured	%	Mean Sums Insured
Homes and Apartment Buildings	19,628,912	37.8	3,737,564,527,445	64.3	190,411
Offices	275,397	0.5	172,815,296,689	3.0	627,513
Other: Commercial, Industrial, Sundry	3,790,365	7.3	1,892,335,825,377	32.6	499,249
Infrastructures	139	0.0	7,658,636,508	0.1	55,098,104
Motor vehicles	28,274,846	54.4	-	-	-
Total	**51,969,659**	**100**	**5,810,374,286,020**	**100**	**245,217**

Figure 10. No. of policies, sums insured, and mean sums insured by risk category. 2019.

N.B.: There are no records for the sums insured for motor vehicles, and that value has not been taken into account when calculating the total mean sums insured values.

To end this section, we would point out that the data for the sector for 2019 compiled from the SIR were consistent with the data for 2018 compiled from the previous system of statistical data sheets submitted to the CCS by insurers and with the time series considered.

Based on the data reviewed up to this point, the SIR appears to have worked as expected during its first year of operation. Nevertheless, we would note that a series of steps intended primarily to improve data quality are needed to increase data utility and enhance usage of all this information from the SIR. These steps will be discussed in the course of this paper.

B) Business interruption

The **number of policies** for 2019 by risk category is:

Number of policies by risk category 2019						
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry and Infrastructures**	**Motor Vehicles**	**Total**
2019	14,090,911	196,212	1,146,838	199,144	541,260	16,174,264

Distribution by risk category as apportioned in 2018.
Figure 11. Number of policies by risk category. Business interruption. 2019.

Number of policies by risk category 2018						
Year	**Homes and Apartment Buildings**	**Offices**	**Commercial and other Simple Risks**	**Industry and Infrastructures**	**Motor Vehicles**	**Total**
2018	14,979,727	184,309	1,077,818	187,159	508,685	16,937,698

Figure 12. Number of policies by risk category. Business interruption. 2018.

Comparing these data with the data for 2018 from the statistical data sheets submitted to the CCS by insurers yearly, the number of policies declined from 16.94 million policies in 2018 to 16.17 million policies in 2019, a 4.5 % decrease from the previous year.

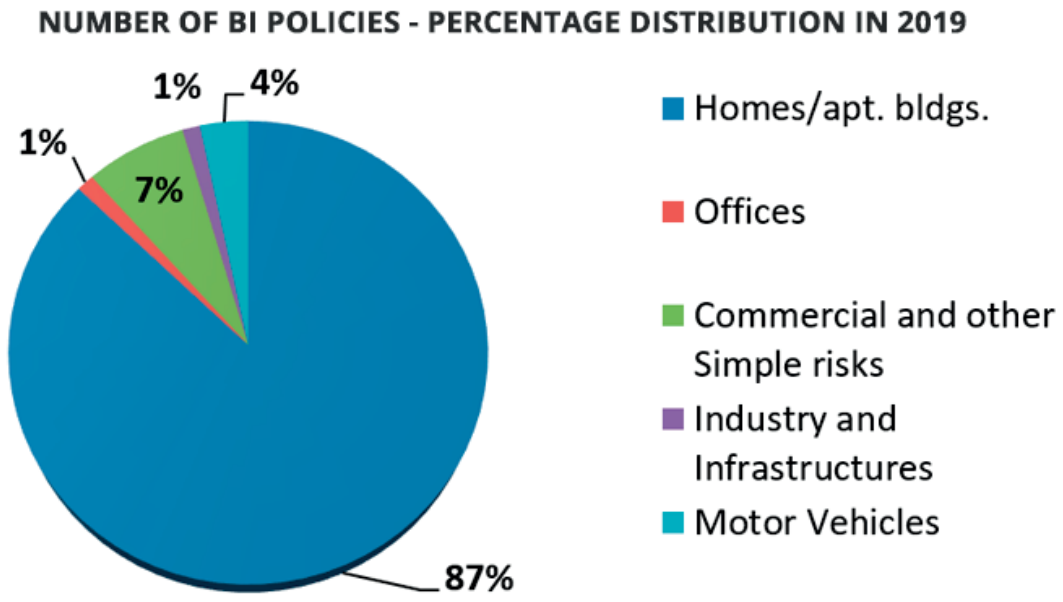

Figure 13. Percentage distribution of policies by risk category. Business interruption. 2019.

Business interruption policies for homes and apartment buildings can be seen to account for 87 % of the total, followed by commercial and other simple risks at 7 % of the total.

The time trend for the number of business interruption policies since 2004, the year in which this cover was included in the extraordinary risk coverage scheme, is shown below.

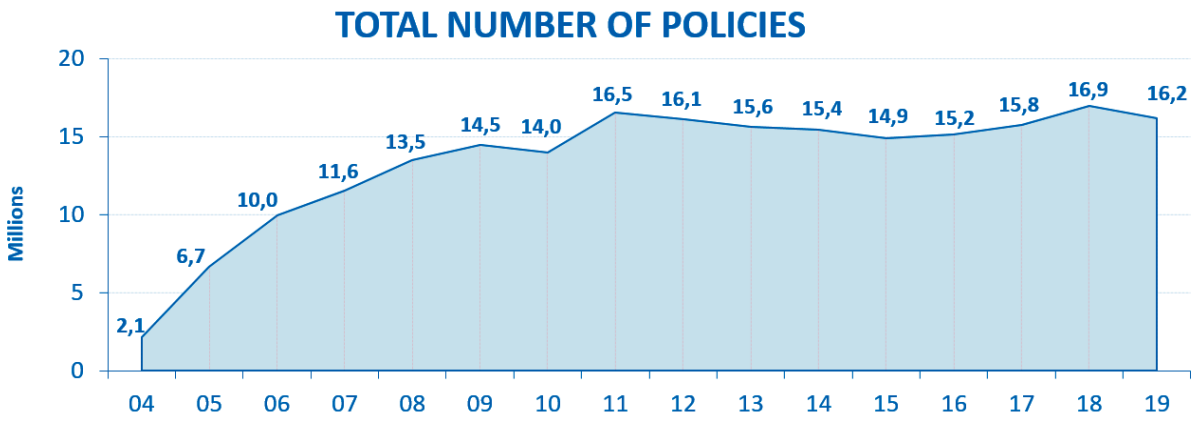

Figure 14. Time trend for the number of policies. BI. Time series for 2004-2019.

The **sums insured** for 2019 and 2018 by risk category follow:

Insured sums by risk category 2019					
Year	**Offices**	**Commercial and other Simple Risks**	**Industry and Infrastructures**	**Motor Vehicles**	**Total**
2019	16,397,048,950	102,716,773,710	206,329,255,188	535,697,204	325,978,775,053

Distribution by risk category as apportioned in 2018.
Figure 15. Sums insured by risk category. BI. 2019.

Insured sums by risk category 2018					
Year	**Offices**	**Commercial and other Simple Risks**	**Industry and Infrastructures**	**Motor Vehicles**	**Total**
2018	15,856,865,040	99,332,875,264	199,531,950,125	518,049,211	315,239,739,640

Figure 16. Sums insured by risk category. BI. 2018.

N.B.: There are no data for the sums insured for homes and apartment buildings, because that information is not needed to calculate the surcharges, and the value is not known to insurers in all cases. The business interruption value for homes and apartment buildings is in addition to the sums insured set out here.

Sums insured for business interruption increased by 3.4 % from 2018 to 2019.

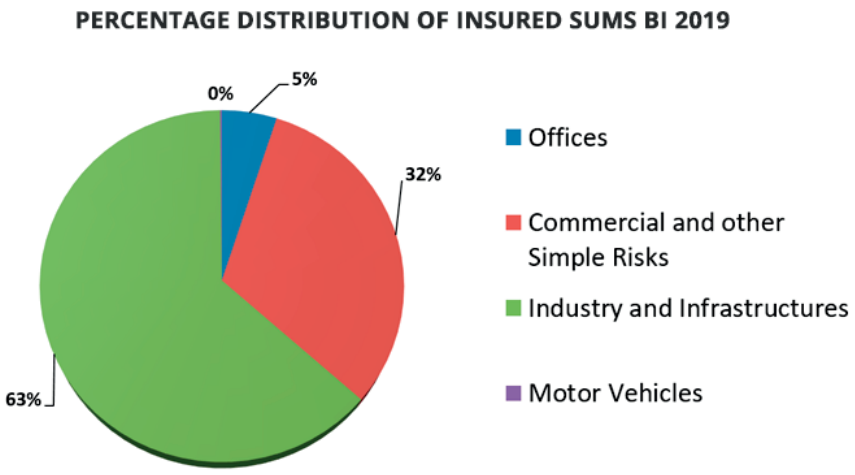

Figure 17. Percentage distribution of sums insured by risk category. BI. 2019.

The largest sums insured were for industry and construction, which accounted for 63 % of the total, followed by commercial and other simple risks, which made up 32 %.

Time trend for sums insured for the period 2004 to 2019:

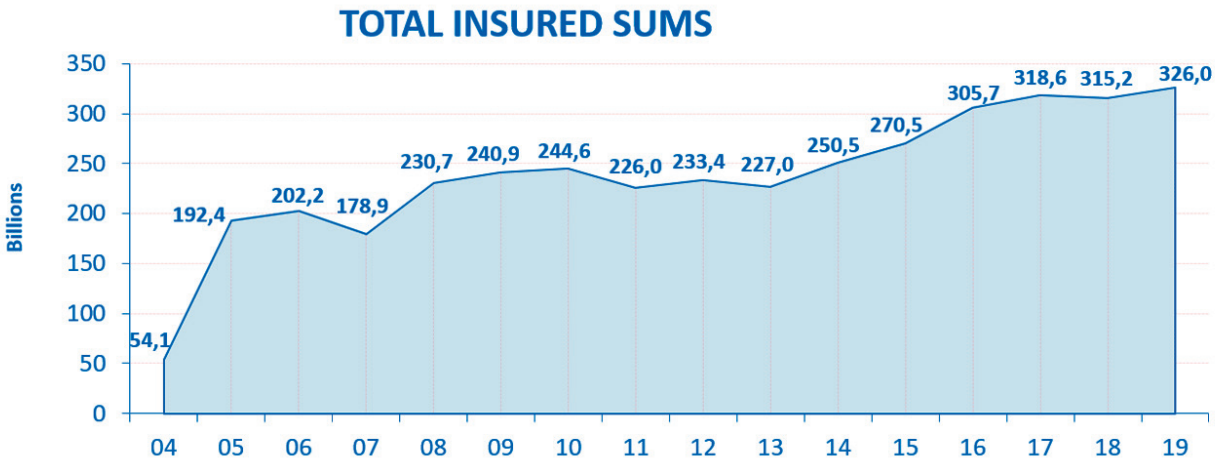

Figure 18. Time trend for sums insured. Business interruption. Time series for 2004-2019.

The summary for business interruption by risk category in 2019 appears below:

Number of policies, insured sums, and mean insured sums by risk category 2019					
Risk Category	No. of Policies	%	Insured Sums	%	Mean Insured Sums
Homes and Apartment Buildings*	14,090,911	87.1	-	-	-
Other Risks	2,083,353	12.9	325,978,775,053	100	156,468
Total	**16,174,264**	**100**	**325,978,775,053**	**100**	**156,468**

* Does not include "Insured Sums", because this value is not a factor for calculating the Fund's surcharges for BI, which are here based on the insured sums for property damage.

Figure 19. No. of policies, sums insured, and mean sums insured by risk category. BI. 2019.

To end this section, we would point out that the data for 2019 compiled from the SIR were consistent with the business interruption data on record for previous years.

C) Personal injury

The **number of policies** by type of insurance in 2019 and 2018 are shown below:

Number of policies by type of insurance 2019			
Year	**Accident and Life Risk Insurance**	**Accident Insurance for Travel paid by credit**	**Total**
2019	51,720,143	162	51,720,305

Number of policies by type of insurance 2018			
Year	**Accident and Life Risk Insurance**	**Accident Insurance for Travel paid by credit**	**Total**
2018	59,209,900	1,846	59,211,746

Figure 20. Number of policies by type of insurance. Personal injury. 2019 and 2018.

The percentage distribution of the number of personal injury policies for 2019 by type of insurance is as follows:

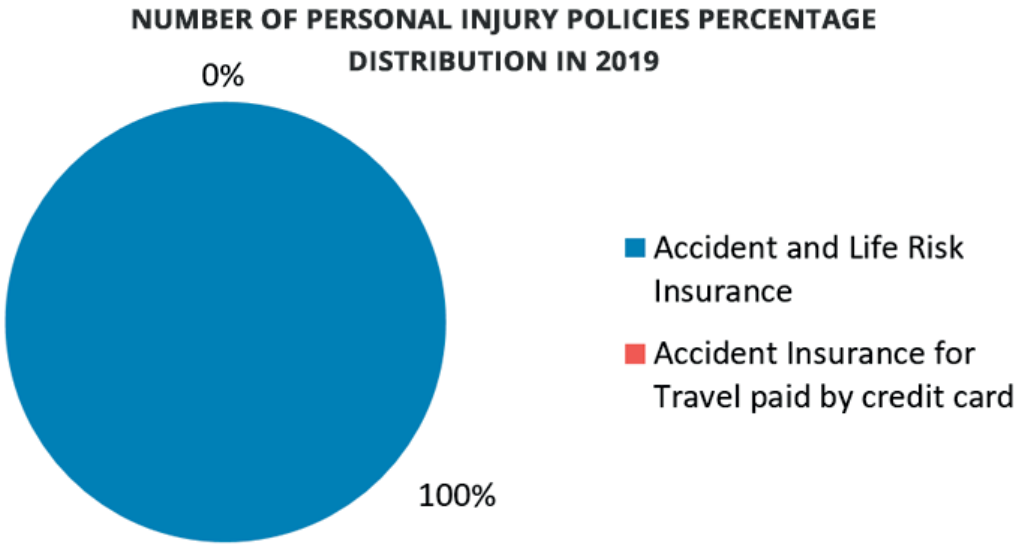

Figure 21. Percentage distribution of no. of policies by type of insurance. 2019.

Accident insurance policies for travel paid by credit card did not account for even 1 % of the total. There were 162 policies of that kind out of 51.7 million total personal loss policies in 2019.

The time series trend for the number of policies for the period 2000-2019 is:

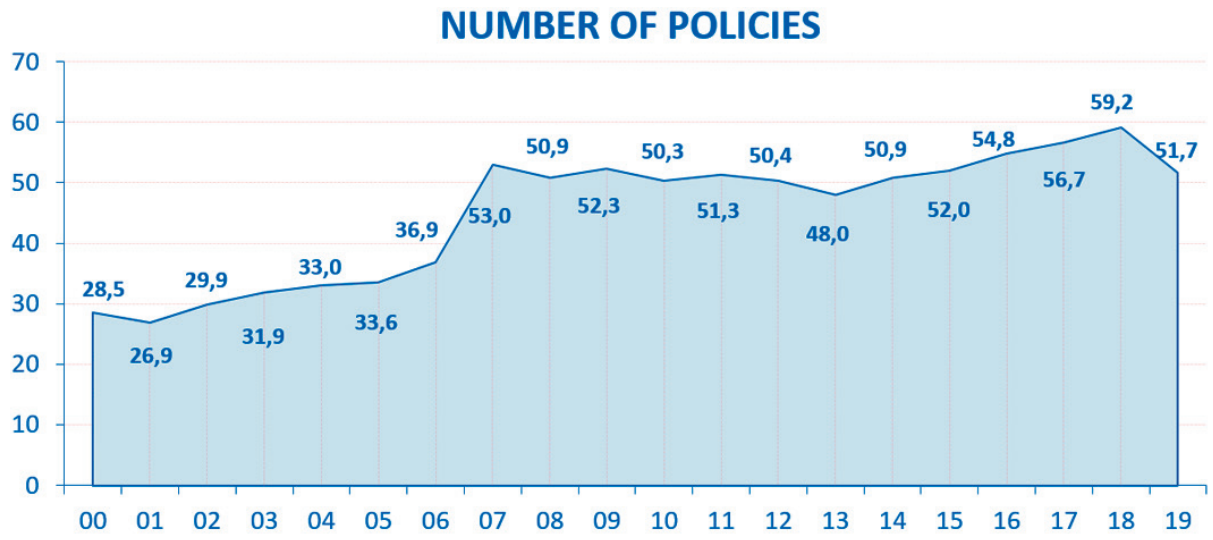

Figure 22. Time trend for the number of policies. Personal injury. Time series for 2000-2019.

We would again say that our conclusion is not that the number of policies taken out decreased from 2018 to 2019 but rather that, firstly, the data have been refined, and the 2019 value of 51.7 million policies, each identified by their insurer and policy number, is considered more reliable; secondly, the 2018 data for policies issued or renewed during the year and the 2019 data for policies active on 31 December 2019 are not exact equivalents; and thirdly, the 2019 data do not include multi-year policies, whole life or term, that have an inception date and surcharge collection date earlier than 1 January 2019.

The **sums insured** for 2019 and 2018 by type of insurance are:

Insured Sums by Type of Insurance 2019			
Year	**Accident and Life Risk Insurance**	**Accident Insurance for Travel paid by credit card**	**Total**
2019	5,783,732,830,881	2,314,941,784,927	8,098,674,615,808

Insured Sums by Type of Insurance 2018			
Year	**Accident and Life Risk Insurance**	**Accident Insurance for Travel paid by credit card**	**Total**
2018	5,782,373,903,270	5,597,422,817,039	11,379,796,720,310

Figure 23. Sums insured by type of insurance. Personal injury. 2019 and 2018.

The percentage distribution of sums insured for 2019 by type of insurance is as follows:

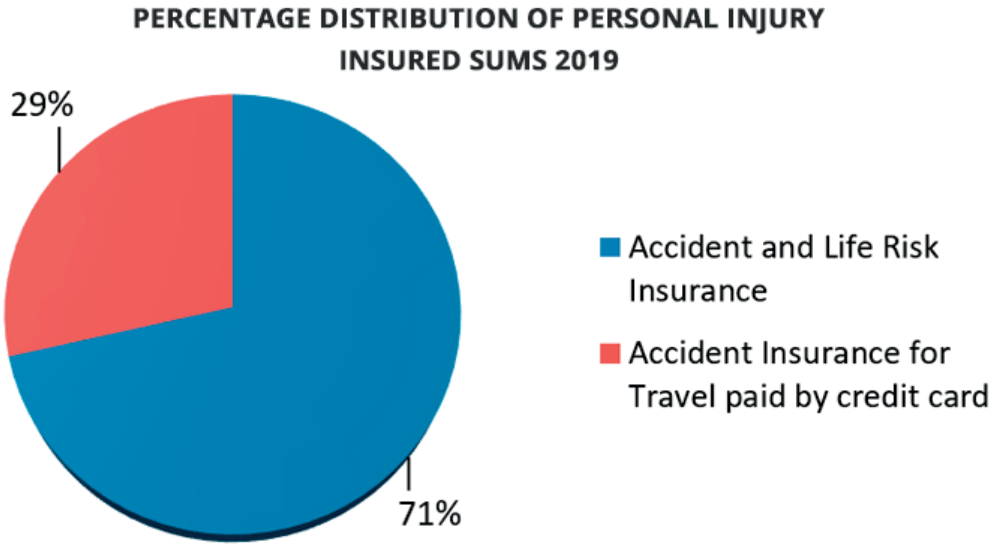

Figure 24. Distribution of sums insured. Personal injury. 2019.

It can be noted that 71 % of the sums insured were for accident and Life Risk insurance and 29 % for accident insurance for travel paid for by credit card.

The time trend for sums insured for personal injury for the periods 2000-2019 and 2010-2019 is represented graphically below:

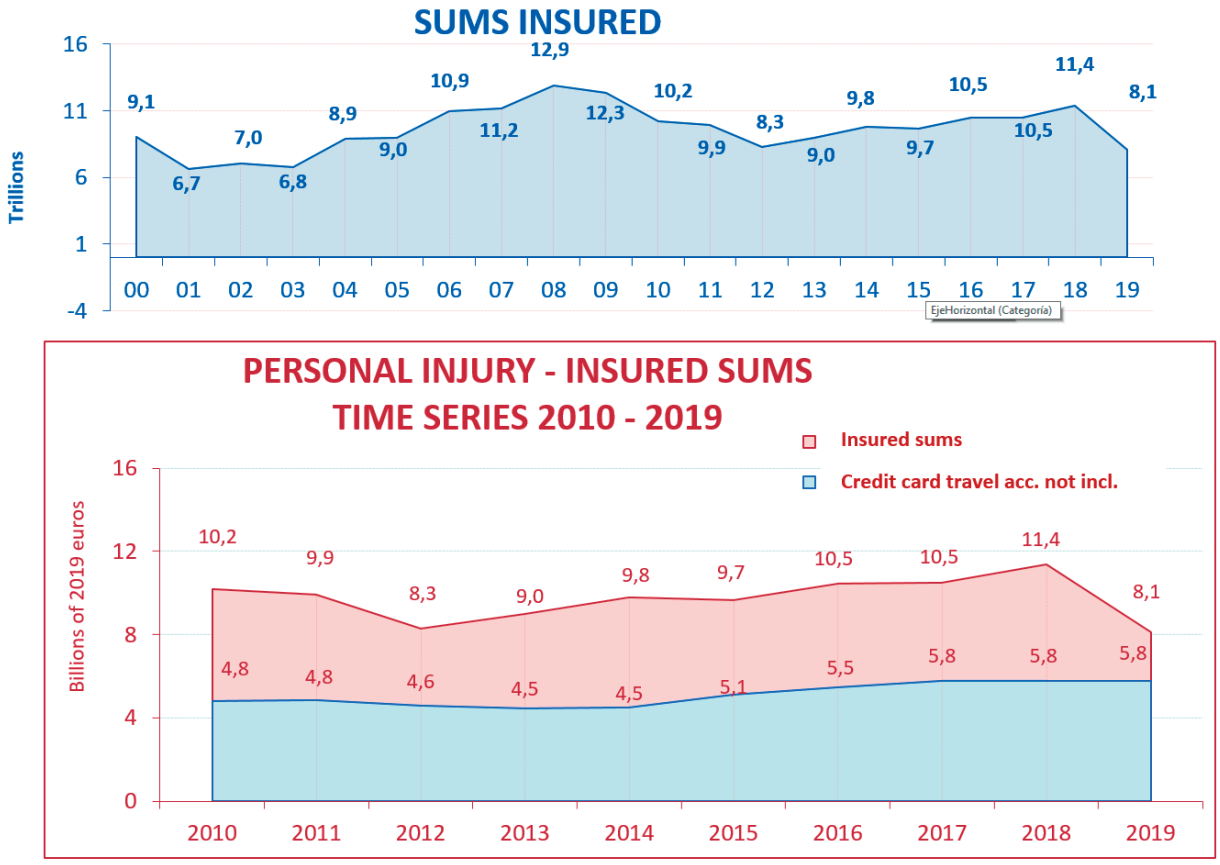

Figure 25. Time trend for sums insured. Personal injury. Time series for 2000-2019 and 2010-2019.

The decrease in sums insured from 2018 to 2019 was due to the same causes as for the number of policies and further to a substantial reduction in the sums insured under accident insurance policies for travel paid by credit card. Though this makes up a large proportion of sums insured (29 % of the total), it represents a very small percentage of its surcharge base, because these insurance policies have a reduced rate.

The number of policies, sums insured, and mean sums insured for 2019 by risk category are shown below by way of a summary from the personal injury data:

Number of policies, sums insured, and mean sums insured by risk category 2019					
Risk Category	**No. of policies**	**%**	**Sums Insured**	**%**	**Mean Sums Insured**
Accident and Life Risk Insurance	51,720,143	100.0	5,783,732,830,881	71.4	11,827
Accident Insurance Travel paid by credit card	162	0,0	2,314.,941,784,927	28.6	14,289,764,104
Total	**51,720,305**	**100**	**8,098,674,615,808**	**100**	**156,586**

Figure 26. No. of policies, sums insured, and mean sums insured by risk category. 2019.

Following the preceding analysis and discussion of property damage, business interruption, and personal injury data, there follows a summary of the number of policies and sums insured for those three types of insurance in 2019:

Policies and insured sums 2019		
2019	**No. of Policies**	**Insured Sums**
Property damage	51,969,659	5,810,374,286,020
Business interruption	16,174,264	325,978,775,053
Personal injury	51,720,305	8,098,674,615,808

Figure 27. 2019 data on policies and sums insured.

Where a single policy includes covers for more than one of the preceding types of insurance, property damage, business interruption, and/or personal injury, it is counted as a separate policy for each of the types concerned. This results in an appreciable increase in the overall number of policies, whereas the sums insured are divided among the different types.

The conclusions that can be drawn following this analysis of the data on the number of policies and sums insured for 2019 using the SIR and comparison with the data for 2018 and the time series are:

- The overall data for the insurance sector for 2019 are uniform and consistent with the data for previous years.
- Errors by certain insurers in the reporting procedure have been detected and have had to be addressed. This was attributable to the system's inherent flexibility in data entry and reporting by insurers during the first year of operation.
- In relation to this same aspect, there remains considerable room for improvement of the quality of the data in the SIR.

As we have just mentioned, the quality of the information reported by insurers using the SIR can be optimised, so the next section deals with prospects for improving the SIR data and the scope of the information in the future.

2. Prospects for improving the information reported using the SIR

Now that the SIR collection system has been implemented and is operational, CCS's goal is to achieve substantial improvements in the quality of the data reported by insurance companies.

To that end, two measures will be undertaken:

1. **New transaction data validation** will be added to the SIR application to improve the quality of the data reported by insurers.

   This change will require some insurance companies to change their procedures to meet the new requirements for data files submitted to the Fund. The application will flag deficiencies in the information in the files that have been sent, and these deficiencies will have to be corrected before the system will allow the insurance company's file to be processed. No processing will be possible until the deficiencies in the file have been corrected, and as a result the report will not be deemed to have been properly submitted on time.

   Insurance companies will be given sufficient advance notice of implementation of these changes to enable them to make preparations to fulfil the new requirements during 2021, so that the data for that year will be of better quality, and complete and fully valid information will be available in January 2022.

   The following compulsory requirements will be established for files reported by insurance companies to improve the quality of the data reported for processing using the SIR: (i) consistency between **total values reported, limits of indemnity, and surcharges** for exceptional risk coverage will be required; (ii) the **post code** data item for risk location will have to be a valid code in the Post Office's post code database; and (iii) consistency will also be required for the **dates reported**, e.g., between the inception data and date of expiry of the coverage.

   These measures are intended to help companies complete their files with data of good quality, with a view to improving the data available and the utility and operation of the SIR.

2. Measures dealing with **aggregated results at the policy or insurer level**, that is, with transactions already reported.

   These measures will entail subsequent validation to detect incidents for specific policies or insurance companies when the relationship between the surcharge, limits, and capital exposure is outside the bounds established by the rate algorithm or when values are outside the range or are inconsistent with values reported in previous years. If these types of discrepancy are found, the insurer will be contacted to review the data.

3. Scope of future data reporting

CCS's new Surcharge Reporting System (SIR), which became operational in January 2019, represents a milestone in data traceability and calls for a global approach to analysing, processing, and using the data so that the information will be more useful.

By implementing the measures discussed in this paper and others that will become apparent in the course of time, the Fund will be able to expand and improve its information. Namely:

i. Data on **capital exposure** will be disclosed, because the maximum sums insured, i.e., insured sums, not capital exposed, were reported in 2019.

ii. Data on sums insured and capital exposure will be available by geographic location (post code and province) and by category of risk.

Global information on the location of risks nationwide will be made available to insurance companies, providing them with added value over and above the efforts involved in implementing the new surcharge and data reporting model.

CCS, and the insurance sector generally, will be able to use the SIR data to disclose areas where insurance coverage is low and take steps to promote insurance in those areas. The analysis will produce findings relating to incentives to buy insurance, proactive risk reduction measures, protocols for dealing with recurring risks, and so forth.

2019 Surcharges: effect of the Decision dated 28 March 2018

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The exceptional risk surcharge was modified two years ago by the Decision of 28 March 2018 by the Direction-General for Insurance and Pension Funds approving the compulsory surcharges payable to the Consorcio de Compensación de Seguros (CCS or Consorcio) by the insured for coverage under the compulsory Extraordinary Risk Insurance Scheme.

As explained in the article published in issue number 8 of this magazine, the purpose of the Decision was to slow the growth of the CCS's stabilisation reserve to cover damage to property, personal injury, and business interruption from the listed 'extraordinary' risks, to introduce certain technical improvements by adjusting the regulations to standards for applying the rate ensuing from responses to a consultation by insurance companies, and to simplify how the rate is applied.

The new Decision took effect gradually from 1 July 2018 for newly issued policies and renewals but was not applicable to adjustments to previously existing policies.

Therefore the first surcharges collected under the new Decision, for the month of July 2018, reached the Consorcio in August of that same year.

In quantitative terms, the adjusted rate has been implemented by reducing the premium rates for all Consorcio covers. The margin for the average combined ratio for the period from 1987 to 2016 was sufficient, and severity was not high.

According to estimates resulting from actuarial studies carried out when drawing up the current rate for exceptional risk coverage, after switching over from applying the 2006 Decision to applying the 2018 Decision to the same sums insured, the Consorcio's surcharges were to be lowered by an average annual amount of 13.3 %.

Estimates by type of insurance:

- Property damage: an 11 % decrease.
- Personal injury: a 42 % decrease.
- Business interruption (BI): a 30 % decrease.

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Two years after the Decision took effect, we have analysed the impact of applying the Decision, to see whether the estimated 13.3 % decrease in the surcharges on the same sums insured has actually materialised.

We first compared the surcharges collected by the Consorcio in the first 12 months from when the new rates took effect (August 2018 to July 2019) to the surcharges collected in the preceding 12 months (August 2017 to July 2018), which we have taken as the base period for the comparison.

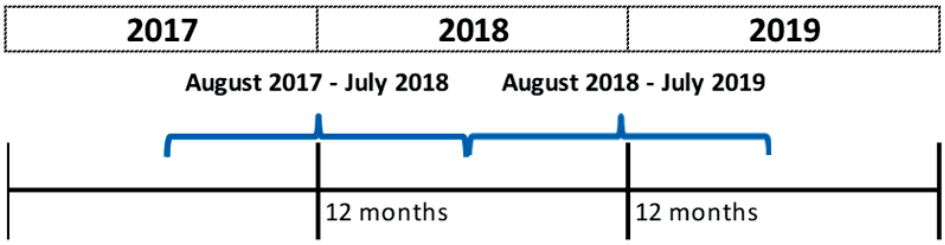


Figure 1. Base period and first 12 months of the new rate.

The following table sets out the surcharges collected by the Consorcio in the two periods described above:

In millions of €

Surcharge	Base period August 17 - July 18	Period 1 August 18 - July 19	Reduction in surcharges
Property	693	653	-5.8%
Personal	21	15	-27.6%
BI	57	47	-16.7
Total	**770**	**715**	**-7.2%**

Figure 2. Surcharges collected in each period.

As a starting point, it should be noted that the reduction in revenues in the first 12 months of application of the new rate compared with the preceding 12 months, the base period, came to 7.2 % for the three types of insurance.

Nevertheless, it needs to be pointed out that this preliminary analysis contains an element of distortion because the sums insured have increased compared to the base period over the period in which the new rate has been in effect.

To remove this distortion, we have taken as the reference data the sums insured reported by insurers for each of the periods based on the statistical data sheets reported to the Consorcio for the year 2018 and data extracted from the Surcharge Reporting System for 2019. Figures 3 and 4 show the following:

- Figure 3: increase in the sums insured by property damage, personal injury, and BI insurance. Here the sums insured have not been updated, because the surcharge reference data have likewise not been updated.
- Figure 4: these data have been used to calculate the change in the surcharges/sums insured ratio in each period.

In millions of €

Insured sums	2018	2019	Increase in insured sums
Property	5,675,772	5,810,374	2.4%
Personal (Travel accidents not incl.)	5,736,482	5,783,733	0.8%
BI	314,065	325,979	3.8%
Total	**11,726,319**	**11,920,086**	**1.7%**

Figure 3. Increase in sums insured from 2018 to 2019.

In millions of €

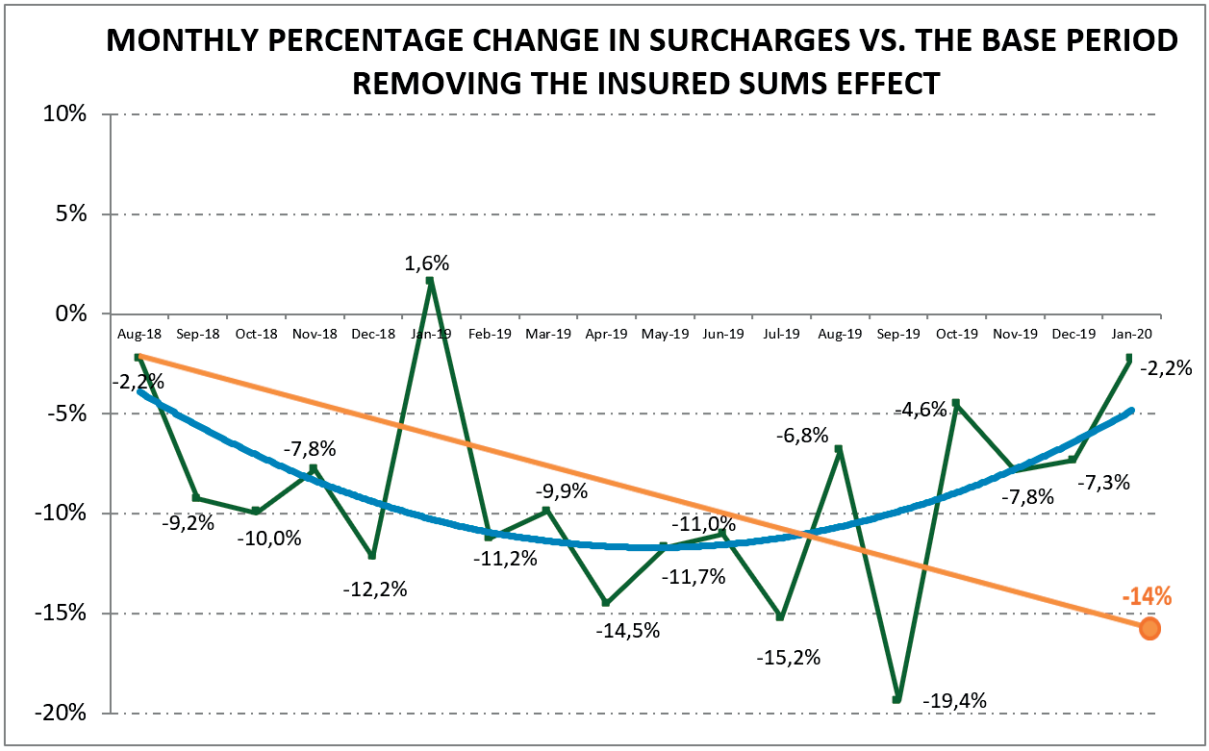
Surcharge w/o effect of increased insured sums	Base period August 17 - July 18	Period 1 August 18 - July 19	Reduction in surcharges
Property	693	637	-8.0%
Personal	21	15	-28.2%
BI	57	45	-19.8
Total	**770**	**698**	**-9.4%**

Figure 4. Surcharges collected, removing the effect of the increase in sums insured.

The conclusion we can draw is that in the first 12 months in which the new rate has been in effect, surcharges collected by the Consorcio decreased by 9.4 % compared with the 12 months that preceded entry into force of the rate.

It should be emphasised that this 9.4 % reduction in surcharges is less than the expected 13.3 % because application of the new rate has occurred gradually as time has progressed.

The next plot illustrates how, after removing the effect of the increase in the sums insured in the following six months (from August 2019 to January 2020), the decrease in the surcharges has continued, though more weakly compared to the months comprising the base period.



Green line: change in surcharge revenues under the new rate **compared to the same month in the base period**.
Blue line: trend in the previous percentage values (month on month).
Orange line: **cumulative change** in the rate after August 2018 (18 months), removing the effect of changes in the sums insured.

Considering the global month on month analysis, we would underscore that introduction of the new rate has been ongoing and has progressively affected the decrease in revenues. The blue line (tending to zero) shows that the effect of the new rate had been consolidated by around January 2020.

Comparing the 18 months during which the new rate has been applied to the preceding 18 months and removing the distortion arising from the increase in the sums insured, the decrease in the surcharges attains 14 %, quite close to the estimate of 13.3 %.

We can therefore conclude that, over an 18-month period, the impact of applying the Decision of 28 March 2019 on revenues from exceptional risk surcharges has been in line with projections.

Mapping flood risk in Spain from Extraordinary Risk Insurance Scheme data

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As discussed in the opening article of this same issue of the magazine, flood risk is the one that accounts for the largest share of indemnities paid out by the 'Extraordinary Risk Insurance' Scheme in Spain. In the past 25 years, flooding has been the cause behind 69 of every 100 euros paid out in compensation to insured parties by the Consorcio de Compensación de Seguros (CCS) for property damage in Spain. For purposes of coverage by the CCS, flooding is defined as follows in Rule 2(c) in the Implementing Regulations for the Extraordinary Risk Insurance Scheme: "the inundation of land caused by the direct action of rainwater, meltwater, or waters from lakes with natural outlets, rivers or inlets, or natural surface watercourses through overflow of their natural beds or channels, and coastal ocean wave battering. Inundations caused by waters from dams, canals, sewage systems, collectors, and other underground channels built by man that burst, break, or malfunction from causes other than extraordinary risks covered by the Consorcio de Compensación de Seguros, or by rain falling directly on the insured risk, or by rainfall runoff collected by rooftops, drainage systems, or courtyards will not be defined as flooding."

There is a further circumstance that makes the Consorcio de Compensación de Seguros data especially appropriate for studying this peril: the CCS is the only agent in our country that pays compensation for flood damage to insured property. Wind is a peril shared by private insurers and the CCS, in that the Extraordinary Risk Insurance Scheme compensates for damage only on attainment of the threshold of an atypical cyclonic storm (ACS or TCA for the Spanish), practice ordinarily when the threshold of 120 km/h is passed. In contrast, there is no threshold for fluvial, pluvial, or coastal flooding, and the CCS is the owner of 100 % of the risk. For this reason, Extraordinary Risk Insurance Scheme data make up the entire body of data on flood damage to insured property.

Based on the reworked insured damage data, flood risk is greater in provinces that combine nearness to the sea, substantial relief with short fluvial watercourses and low accumulation times, and plains or valleys densely populated by people. Thus, Guipúzcoa, Murcia, and Alicante, in that order, report the greatest per capita damage. To a lesser extent, this is also the case for the rest of the Mediterranean coastal region – except for Granada, for the simple reason that most of the population does not live along the coast but in the metropolitan area of the capital city, and for Barcelona, because its extremely large population brings the average down considerably – and for the provinces of Cádiz, Pontevedra, and Santa Cruz de Tenerife.

The purpose of this article is thus to carry out a spatial analysis of flood risk by province, both because of the size of that peril and because the CCS holds all the insured damage data. It should be noted that this study based on insured damage data has been limited to fluvial and pluvial flooding; that is, coastal flooding (and wave battering damage) has not been included.

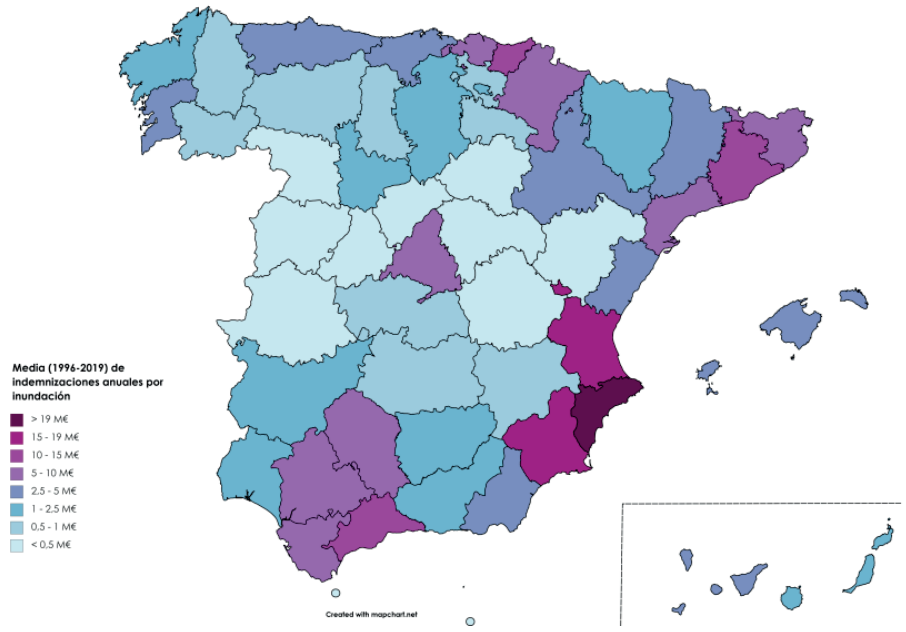

Figure 1. Average annual compensation for fluvial and pluvial flooding (1996-2019).

The first illustration, Figure 1, shows the average annual compensation for flood damage per province over the study period. This direct graphic representation in itself reveals several noteworthy features: higher levels of damage in the coastal provinces, particularly along the Mediterranean coast and the Bay of Biscay; greater damage in the basins along the largest rivers, especially the Ebro and the Guadalquivir rivers and to a lesser extent the Duero and the Guadiana rivers; plus an accumulation of damage in the region of Madrid.

Figure 2. Physical map of the Iberian Peninsula and the Balearic and Canary Islands.

Let us pause here for a moment to briefly consider the geography of Spain (Figure 2), which encompasses two quite different settings. The first consists of a peninsula and an archipelago (the Balearic Islands), plus Spain's autonomous city enclaves in North Africa, together making up an environment partway conditioned by Atlantic, Mediterranean, and continental African influences. The interaction of these influences and the markedly mountainous terrain that generally tends to be located quite close to the coast, particularly in the case of the Atlantic coast north of Portugal, along the Bay of Biscay, and the entire Mediterranean coast, including the Balearic Islands, gives rise to a patchwork of climates with few equals in Europe and a variety of sizeable repercussions for the hydrographic network. First of all, the proximity of significant topographical relief to the main source of moisture, the sea, heightens the impact of precipitation in the above-mentioned areas along the Bay of Biscay and the Mediterranean by forcing air masses to rise, which is conducive to condensation and increases the precipitation rate while at the same time blocking oceanic air flows, causing these to be longer lasting and resulting in greater accumulation. The small space available between the mountains and the sea means that river courses tend to be short, with steep slopes (and in the case of the Mediterranean, with highly irregular flow volumes), leaving only short windows for precipitation to accumulate from when it starts to fall to when it is discharged into the river network, in that way exacerbating the problem of flooding. Only the southwestern part of the peninsula allows oceanic air flows to penetrate inland, contributing to a more even distribution pattern of precipitation.

Figure 2b. Provinces of Spain (Source: Wikipedia).

Most of the large rivers empty into the Atlantic, but the Ebro, the river with the highest average volume of flow in the peninsula, discharges into the Mediterranean, while its headwaters have Atlantic features. This is why regions like Navarre record some of the highest rates of damage, and accumulated flows in the middle section of the river course also cause extensive damage in provinces like Zaragoza. Something similar can be said of the mountainous or highland areas that are the source of the tributaries to the middle section of the Guadalquivir River, causing flooding in the provinces of Córdoba, Seville, and Cádiz. The province of Málaga is affected by similar situations on the other side of the mountains.

Figure 1 distinctly shows that, in absolute terms, the greatest damage is concentrated in the provinces of Alicante, Valencia, and Murcia. It is here where the effects of the potentially heavy precipitation that usually falls in late summer

and early autumn combine with the effects of a very warm sea and inflows of cold air in the mid to upper layers of the atmosphere – the Spanish DANAs, or cut-off lows – and with the orographic effects of tall mountains near the sea and the presence of coastal plains which, while narrow, allow people and economic activities to gather there. And it is also here where all those watercourses, whether still extant or overrun by human occupation of the land, spill out and can go from dry to carrying large volumes of water in a matter of minutes.

The Canary Islands are the second setting we mentioned above. This archipelago consists of a group of islands, volcanic in origin, located in subtropical climes off the continent of Africa, part of a larger group of widely scattered islands of similar origin, called Macaronesia. While as a rule the Canary Islands suffer less flood damage than the rest of the country, their relief features are not so different: high elevations quite near the coast, little time for precipitation to accumulate, and watercourses that can go from dry to full with strong, heavy flows in just a few minutes. The islands are spared worse problems only because there is less active cyclonic circulation and convection there. However, major damage has occurred when these conditions have arisen, sometimes as a result of tropical storms or hurricanes, which seem likely to increase in the future.

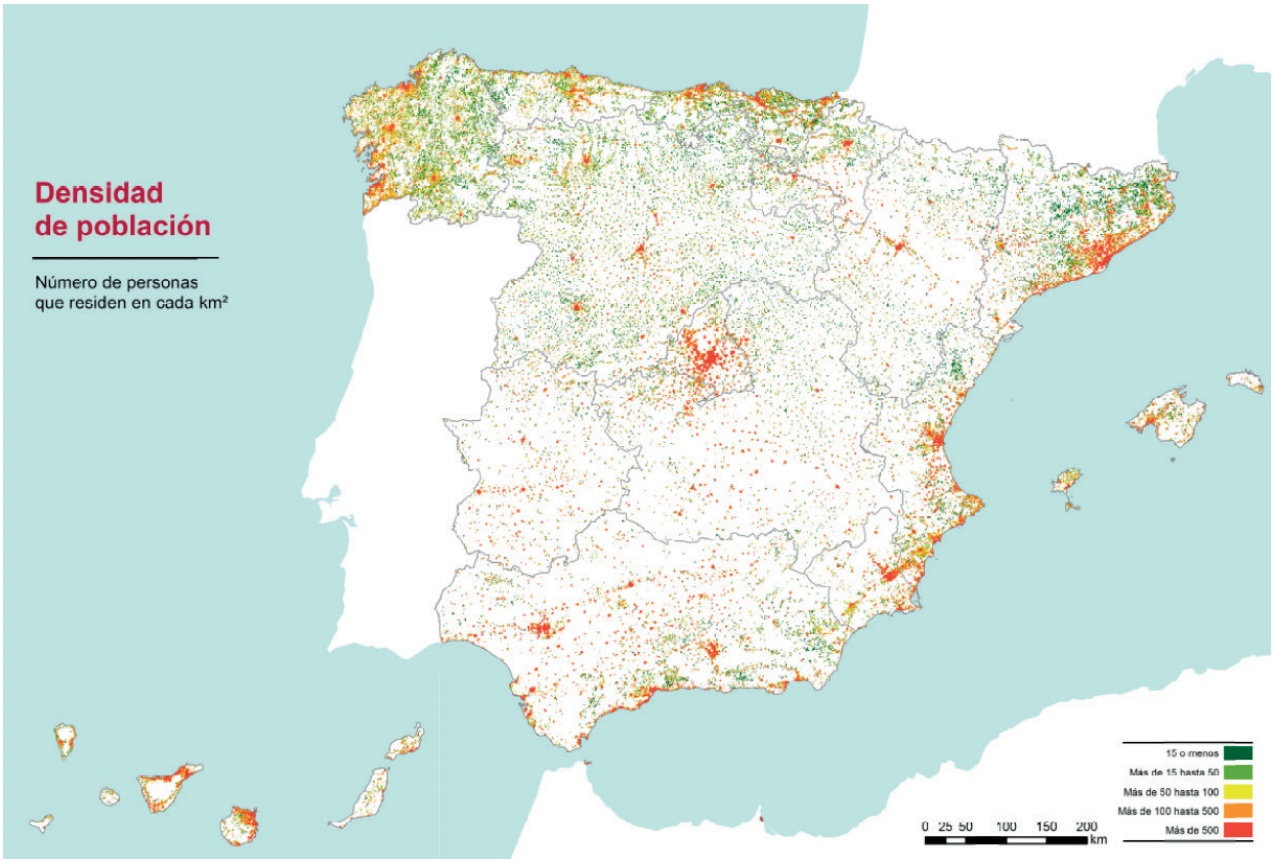

Figure 3. Population density in Spain. Source: INE [Spain's National Institute of Statistics], 2011.

A little earlier we mentioned a factor that is just as important as physical geography, namely, human occupation. Ultimately, when speaking of damage, we are speaking of exposed property, something that is inherently human. Figure 3 depicts population density in Spain and clearly shows that the country mimics a certain "atomic" structure, with most inhabitants divided between the "nucleus" (Madrid) and the "shell" (the coast, sometimes extending inland, as in Galicia, Catalonia, and Andalusia). This is the now-famous notion of "empty Spain", the prevailing situation in most of the country, which is also reflected in indemnities for damage. In the islands too, most of the population is concentrated along the coast, clearly discernible, for instance, on Tenerife and Grand Canary Island. Therefore, an exercise in which the damage for each province is divided by its population to even out the effects of exposure and more accurately determine the level of risk is worthwhile. The results are illustrated in Figure 4.

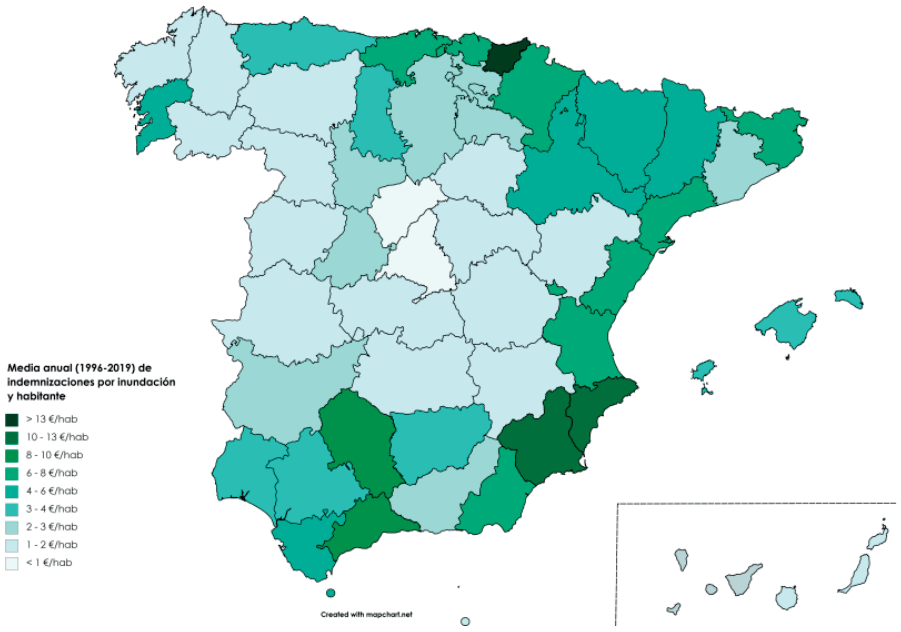

Figure 4. Average annual compensation by flood and by population (1996-2019).

Figure 4 shows that certain effects clearly attributable to cumulative exposure dissipate, e.g., in the province of Madrid. There is a similar effect in Barcelona.

In any case, this map displays a view of real average compensation paid by the CCS per flood over the study period in reference to compensation for damage to insured property only, not to all the damage caused. It is very hard to ascertain all the damage produced by a disaster. Another article elsewhere in this same issue of the magazine addresses this problem and how hard it is to account for all damage. The fact that the data for indemnities for insured damage per flood in Spain all come from a single source, the CCS, simplifies the problem greatly, but still we cannot be sure of the total amount of damage, because not all property is insured. For certain types of property, for instance, infrastructure, insurance penetration is rather low, because it is owned by governments, which self-insure, that is, any damage that is sustained is repaired by the government itself, charged to the budget. Nevertheless, the system allows property of this kind to be insured, and in fact certain levels of government, above all local and regional governments, do insure part of their infrastructure. The CCS estimates that, on the whole, it covers around or somewhat more than half of the total damage caused by flooding. The main source of this gap in damage coverage is presumably infrastructure, proportionally much more costly than other types of property. In its annual "Estamos Seguros" reports, the Spanish insurers' association, Unespa, estimates the percentage ratio of primary residences that are insured to the total number of primary residences by region (Autonomous Community). These are the only data we can use to obtain a closer approximation to what the total amount of damage would be *if all homes were insured*. Nationwide, the proportion of homes insured is around 72 %, though with large fluctuations from 88 % in the Basque Country to 38 % in Ceuta.

We have made a projection of the damage, and the results are shown in Figure 5. On the basis that 34 % of all indemnities paid under the Exceptional Risk Insurance Scheme is for the category of "homes and condominiums", if the proportion of insured homes were 100 %, the total damage for this category would be given by the following formula: DMCP = DMP [0.66 + 0.34(1/PR)], where DMCP is the average adjusted per capita damage by province, DMP is the average per capita damage by province, and PR is homeowners insurance penetration in the Autonomous Community where the province in question is located. We realise that this exercise entails certain problems, such as the fact that some of the homes that are uninsured are probably less expensive than the homes that are insured or that there may sometimes be large differences in insurance take-up among provinces in the same Autonomous Community, but this is as close as we can come to reality. Namely, about 34 % closer to the actual situation, because insurance penetration in

business and industry is still unknown (though we would venture to say that it is as high as or higher than home insurance), and the same holds for infrastructure (distinctly lower). In the case of damage to motor vehicles, all motor vehicles in operation are covered, because the Extraordinary Risk Insurance Scheme has been applied to all automotive insurance policies since July 2016, including compulsory civil liability policies only.

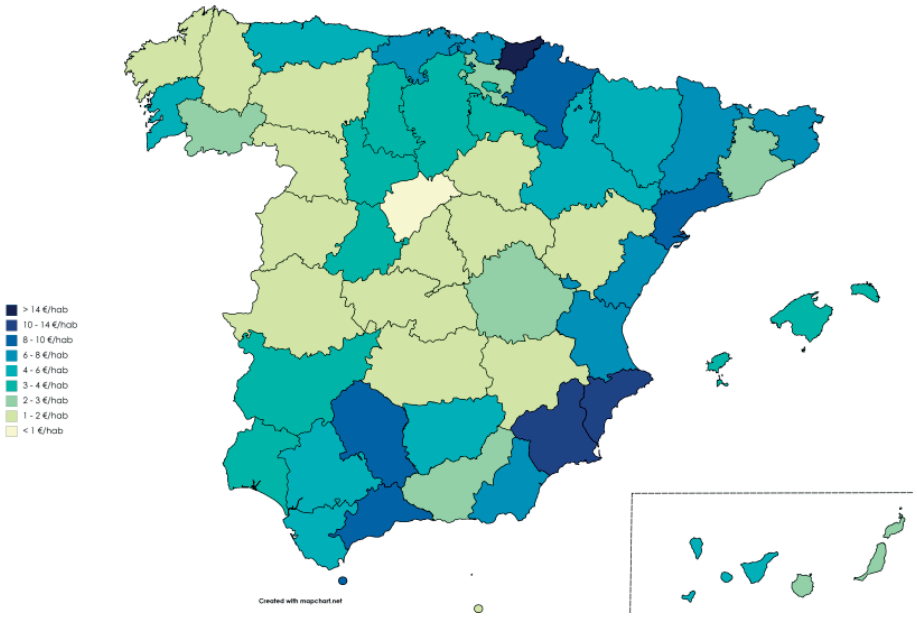

Figure 5. Average annual per capita flood damage by province (1996-2019) adjusted by homeowners insurance penetration.

Figure 5 appears to be relatively consistent, notwithstanding the assumptions that have had to be made. Based on the reworked insured damage data, flood risk is greater in provinces that combine nearness to the sea, substantial relief with short fluvial watercourses and low accumulation times, and plains or valleys densely populated by people. Thus, Guipúzcoa, Murcia, and Alicante, in that order, report the greatest per capita damage. To a lesser extent, this is also the case for the rest of the Mediterranean coastal region – except for Granada, for the simple reason that most of the population does not live along the coast but in the metropolitan area of the capital city, and for Barcelona, because its extremely large population brings the average down considerably – and for the provinces of Cádiz, Pontevedra, and Santa Cruz de Tenerife.

Other provinces like Navarre, Huesca, and Lérida also stand out on this map, even though they are more or less distant from the sea. The reason is the combination of mountains that act to heighten precipitation, watercourses that fill rapidly with water flowing at high energies, and human occupation of fluvial floodplains. Damage occurs also where high flow volumes accumulate and reach the main river channels, such as in provinces like Córdoba and Zaragoza. On the whole, the courses of the Ebro and Guadalquivir rivers, and to a lesser extent those of the Duero and Guadiana rivers, stand out rather clearly for this reason.

To conclude, we would point out, just by way of an interesting titbit of information, that according to the data employed and the results of this study, Segovia is the province with the lowest flood risk in Spain.

Appraising damage caused to a motor vehicle

The Supreme Court gives an opinion for the first time on how to determine the appropriate way to pay compensation for damages caused to a motor vehicle in a traffic accident when the cost of repair clearly surpasses the market value of the damaged vehicle and even the purchase value of a vehicle of the same characteristics in the second-hand market

Comment on the judgment by the Civil Division of the Supreme Court of 14 July 2020

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Regional Representative in Madrid
Consorcio de Compensación de Seguros

1. Introduction

Most traffic accidents only cause property damage among those vehicles involved. In Spain, most such accidents are processed via direct compensation arrangements through the so-called CICOS system (Claims Compensation Computer Centre, *Centro Informático de Compensación de Siniestros*), which handles approximately two million claims a year.

Even so, regardless of whether accidents are processed via direct compensation arrangements (which have the advantage of greater speed in settling the claim) or by conventional means, there always remains the underlying issue of whether it is an own damage claim, where what the policy establishes should apply, or a liability claim, where the aggrieved participant in the accident is a third party that stands outside the contractual relationship between the insurer and the insured and therefore who, pursuant to Article 1 of the Law on Civil Liability and Motor Vehicle Road Insurance and Article 1902 of the Civil Code, should be compensated for loss caused irrespective of what the insurance contract of the perpetrator of the loss might establish.

The so-called total loss clause is usually worded as follows: 'It may be considered that there is total loss of the insured vehicle when the budgeted amount of repairs exceeds 100 % of the compensable or covered value in each case (value as new/market value, depending on the age of the vehicle)'.

The problem the cited clause poses in practice (which stipulates that in the event of total loss of the vehicle compensation shall be paid for the loss according to value at the time of the accident) is whether this is a clause that delimits the risk or which limits the rights of the insured. We cannot assert that there is unanimity in case law as to whether it is consistent with one particular assumption or the other.

Assessing the loss caused in civil liability or third party claims is no easy task, above all when the damage brought about exceeds the value of the vehicle. The judgment we are examining, which is of great interest to all of us who come to be involved in traffic accidents, seeks to determine the premises for settling this question and clarifying the contention which minor case law has upheld in general terms.

2. Appraising damage for vehicles in cases where own damage is covered

As we have already noted, when own damage comes into the equation (usually because the insured is responsible for the accident), not too many problems arise in that, settling the claim must be carried out in accordance with the provisions in the insurance contract.

In such cases, policies generally envisage that compensation for the vehicle parts should be paid at value as new, whereas, if the damage exceeds the vehicle value (sale or purchase value, as appropriate) or a high percentage thereof, compensation is paid for the value of the vehicle at the time of the loss event and applying suitable depreciation. Thus, if the vehicle is not repaired, our discussion does not involve affective value, since, as we shall see anon, this concept is a feature of what are termed civil liability or "third party" claims.

It is also common for own damage cover to involve insuring the vehicle value "as new" for the first two or three years after purchase. Value as new is what appears as the retail value as of the accident date and must include the legal taxation and extra charges that make the vehicle roadworthy.

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The judgments delivered by the Provincial Higher Courts of Vizcaya (Section 3) of 2 June 2011, La Coruña (Section 6) of 6 March 2015, Asturias (Section 7) of 27 November 2015 or Barcelona (Section 13) of 30 April 2013 describe it as a clause that delimits risk, for which reason it is only necessary for it to comply with the requirements for transparency and integration within the contract. On the other hand though, the judgments by the Provincial Higher Courts of Teruel of 21 February 2012, Zamora of 17 November 2015, Orense (Section 1) of 17 November 2016, Alicante (Section 9) of 20 June 2014 or Pontevedra (Section 1) of 12 May 2014 contend that this is a clause that limits the rights of the insured, meaning that pursuant to Article 3 of the Insurance Contracts Act, in addition to the two aforementioned requirements, the clause must be expressly accepted by the policy holder/insured. This means that it must be specifically distinguished from the other clauses and expressly signed. If this is not the case, it will not be binding with respect to the insured and may therefore not be applied by the insurer.

In upholding the latter point of view, judgment 212/2016, of the Burgos Provincial Higher Court of 24 May 2016 argued that 'The limit on compensation, which in own damage cover generally equates to the actual cost of repairs and in cases of total loss or a "total loss" only to the market value of the vehicle, represents a limitation on the coverage or the compensation that the insured naturally expects, which, though it may be a valid clause, to be effective as such requires that the insured has learned of the restrictions which it brings in and that they should not come as a surprise to the latter. And therefore, as a clause that limits the natural providence of the coverage taken out it is subject to the system for validity which is envisaged in Article 3 of the Insurance Contracts Act which, in the case under consideration, has not been satisfied, since for these purposes it appears insufficient just to have carefully framed standard wording signed where the signatory claims to be aware of the limitation clauses contained on a document other than that signed (the general conditions) and which the general clause signed refers to; the requirement in Article 3 of the Insurance Contracts Act cannot be held to have been fulfilled by the simple submission of general conditions...'.

3. Appraising damage for a vehicle in a claim involving civil or "third party" liability

In cases such as these, and as we were saying at the beginning, in practice they pose more problems in that the aggrieved third party is protected by law, which provides that the latter must be compensated for the damage caused. This is what Article 1902 of the Civil Code states when it stipulates that 'someone who causes harm to somebody else through act or omission and where fault or negligent omission is present must remedy the harm caused.' In this regard the issue at hand means examining what is understood by harm caused in certain specific situations. Naturally problems do not tend to arise when the damage is less than the value of the vehicle at the time of the accident. In such cases the damage caused will be the vehicle repair value.

Problems emerge though when the appraised loss exceeds the vehicle's market value. Furthermore, as in the case analysed in the judgment discussed, on top of this there is an additional kind of detriment that is caused to the aggrieved party, such as might concern the replacement vehicle they require while their vehicle is undergoing repair.

Thus far in minor case law, in general terms, when the damage to the vehicle has amounted to more than double or even triple the market value it has been held that the repair value should be paid. In some cases an invoice proving the repairs has been required, whereas in others (particularly of late) the estimate has been accepted, although the judgment ruled a certain window for the aggrieved party to carry out the repairs. It was said that the aggrieved party should not have to put up the money in advance to repair the vehicle first, so the courts interpreted that it would be enough to submit the estimate for the claimant's filing to be accepted.

4. 4. The judgment by the Civil Division of the Supreme Court of 14 July 2020

4.1. The object of proceedings

The judgment examines a case of the kind set out under the previous heading. This involves property damage suffered by the aggrieved party who is filing a claim for damages based on Article 1902 of the Civil Code against the party responsible for the crash and their insurer.

In the claim payment was sought from the joint defendants for repairing the damage suffered to the claimant's vehicle (€6,700), as well as the additional sum of €7,828.63 calculated up to the date of the claim plus subsequent monthly payments for the rental of a replacement vehicle which would continue to accumulate up until the motor vehicle in the accident had been fully repaired.

The defendants contested the claim by pleading (and this is what concerns us) that the damage repair was not financially justifiable given that the repair amount of €6,700 far exceeded the vehicle's market value of €3,470. With respect to the expenses claimed for renting a replacement vehicle, this claim was similarly rejected since they had been generated by the claimant given that the latter knew that the vehicle had been declared a total loss three days after the accident and that therefore there would be no point in repairing it as this would not be financially justifiable.

4.2. Lower court judgments

The judgment at first instance court level gave leave for the claim to proceed in its entirety, concluding that repairing the vehicle whatever the cost represented the preferable compensatory solution, even though the amount for repairing the damaged vehicle was potentially over and above its market price. It also found in favour of the expenses on the replacement vehicle, arguing that the aggrieved party needed the vehicle for their personal activities.

The defendants appealed against this decision. The appeal court judgment was delivered by section 4 of the Granada Provincial Higher Court, which partly allowed the appeals and, in reversing the lower court judgment, it ruled that the appellant defendants in the original claim should jointly and severally pay the claimant the sum of €4,511 plus interest at the statutory rate in contrast to the amount of €14,611.66 which the court of first instance had originally sentenced them to satisfy.

The Court held that the repair work was not financially justifiable, since there was a disproportionate discrepancy between the vehicle's market value (€3,470) and the repair value (€6,700), and it reduced the sentence amount to €4,511, which was the sum arrived at by applying an affective value set at 30 % to the vehicle's market value. It likewise dismissed the ruling that rental expenses should be paid on a car of similar characteristics to that damaged, on the grounds that it was not considered logical for the money spent on renting not to be used on either repairing the vehicle's accident damage or else buying a similar car in the market. It likewise stated that three days after the accident the company had given notification that the vehicle was a total loss.

We should point out that the final decision by the Granada Provincial Higher Court is not typical. Such a solution is normally provided when the aggrieved party does not intend to repair the vehicle. In such a case, the compensation paid out is the vehicle's market value plus a percentage (which tends to be around 30 % of this value) for the trouble that might be occasioned for the aggrieved party when buying a vehicle similar to that which they used to have, concept known as affective value. Nonetheless, when the aggrieved party decides to repair the vehicle, the normal turn of events would have been that, if repairing the vehicle is double its market value, as is the case here, the court would have accepted the latter's claims, even (as we have said) where this involves submission of a repair estimate, as the court of first instance indeed did.

This is why the judgment which the Supreme Court issues is significant, since this is the first time that it has ruled on this matter and, as shall see, as regards repairing the damage it takes the same view as the Granada Provincial Higher Court.

4.3. The stance of the Civil Division of the Supreme Court

The claimant filed an extraordinary appeal against this judgment based on a procedural violation, as well as an appeal to the Supreme Court in the interests of uniform application of cassation law, the first of these being dismissed. In their appeal the petitioner claims that the higher court judgment avoids the fact that an affirmative injunction was sought, which was to address the repair of the damaged vehicle without compensation being requested. This circumstance attests to the fact that their claim for compensation for damage was serious and final and that this therefore did not lack consistency in a legal sense. To justify the appeal being in the interests of uniform application of cassation law, several judgments by higher courts were cited which, in cases such as this one, diverge from the opinion in the decision appealed.

In short, as stated, a legal matter is being raised for the court regarding the way to compensate damage when the sum for repairing a motor vehicle clearly exceeds its value at the time of the loss event. As can be seen, both in the lower court judgment and in that ruled by the High Court, the difference between the repair value and the market value, which is roughly double the amount, is considered to 'clearly exceed the vehicle value'.

After making certain general considerations both concerning the victim's right to obtain reimbursement as a guiding compensation principle given harm or damage unjustly endured and regarding how the property damage suffered should be compensated (and while maintaining that it will have to be rational and fair without it being possible to saddle the perpetrator with disproportional repairs or an exorbitant financial sacrifice beyond the true significance of the damage), the Court stops to examine the problem posed in the case being analysed.

The judgment makes a general analysis of how valuation of property damage should be done, perhaps (although it does not expressly say so) by referring to cases where the vehicle's repairs do not exceed its market value. Thus it says verbatim 'Where property damage is concerned the natural compensation for the detriment is generally achieved

through effective repair of the damage suffered in a specialist workshop, the cost of which the aggrieved party passes on to the perpetrator of the damage or to insurers, who meet the cost of repair directly or compensate it through agreements between them. It is a fact that repair work can entail a certain advantage for the owner of the damaged vehicle which derives from replacement of old and worn parts with new ones in optimum condition, although compensation of the victim cannot be carried out as an exact science so certain benefits are tolerable and fair, while it is still also the case that the vehicle value depreciates when it suffers an accident that impairs it. This specific form of compensation leads us back without further ado to simple assessment of the value of the repair work carried out'.

Even so, in analysing the specific case it asserts that it is not possible to unilaterally impose the repair work or to saddle the cost of it upon the perpetrator of the damage without taking account of what the labour cost comes to and the spare parts required to repair the vehicle in cases of a total loss. It therefore acknowledges that the problem arises when, if repairs are feasible and the owner's intention to carry them out is in earnest and genuine (or even if they have been performed and paid for), the aim is to pass on the cost of these to the perpetrator of the damage even though such a cost is clearly disproportionate with respect to the value of the vehicle at the time of the accident.

Therefore, according to the Civil Division of the Supreme Court, the solution which the lower court's judgment provides is not contrary to the law, whereby the compensation of the aggrieved party is performed by setting a pay-out equal to the price of the damaged vehicle plus a percentage amount, which has been termed a surcharge by way of a supplement for risk or security, and which in our judicial practice has been generalised using the expression 'affective price or value', which is to include administrative expenses, difficulties in finding a similar vehicle in the market, uncertainty as to how well it works, etc. among other circumstances that may be weighed, which must be appreciated by the courts in their specific role of loss appraisal.

To summarise, for the High Court, when repair work is double the market value of the vehicle there is a clear lack of proportion between both items which means that carrying out repairs is not financially justifiable. Thus, in these cases the aggrieved party must be compensated with the market value of the vehicle plus a percentage, by way of affective value, for the trouble caused to them in having to obtain a vehicle with similar characteristics to the one they had before the accident.

With respect to costs to replace the vehicle which the claimant had incurred (€7,828.63), the judgment states that, on the one hand, the insurer delayed its offer to five months after the loss event took place and, on the other hand, rental expenses cannot be demanded until execution of the repair work when the latter was found to be without justification. Therefore the court holds that it is appropriate to grant compensation for the value of the usage which the claimant was deprived of, which amounts to the sums for rental supported by documentary evidence from the accident date up to 8 May 2014 bearing in mind that the company against which action was brought made its offer to pay the relevant compensation on 5 May that same year.

AGERS Guide to the risk management function in insurance companies

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The presentation of the AGERS (Asociación Española de Gerencia de Riesgos y Seguros) [*Spanish Risk Manager's Association*] Guide to the risk management function in insurance companies took place on 6 October 2020. The Guide was written by the members of AGERS's Committee of Experts on Insurance Company Risk, including two members representing the Consorcio de Compensación de Seguros, Eva Valenti, Head of the Actuarial Review Department, and María Nuche, Director of Risk Management.

The Committee of Experts is made up of members in charge of the risk management function at insurance companies of different types and sizes who have been closely involved in the work of implementing and monitoring risk management operations.

This publication is intended to furnish a Practical Guide to the risk management function in the service of the profession, setting out insurance company risk management best practices and in addition addressing compliance with Solvency II requirements.

The main purpose of the Guide is to provide a reference intended to enable insurance company risk managers to ascertain whether or not what they are doing is in line with the common tasks and practices considered, with a view to being able to establish an efficient risk management system. The idea is to provide a flexible model that will allow each company to perform proportional self-assessments under the proposed framework, taking into account its own nature, structure, and internal rules and procedures.

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This publication is aimed at all companies, without regard to size, corporate form, or type of business, on the basis of common patterns that apply to all companies in the person of their risk management officer.

Another of the Guide's aims is to show the supervisory authority the role and position of the risk management function and how common tasks have been implemented by insurance companies in practice for purposes of compliance with regulation general requirements.

Turning now to the actual content of the Guide, the idea has been for each section to provide a description of the tasks and best practices making up a suitable structure for risk management systems and of each of the steps that will ensure proper functioning of each company's risk cycle.

The **first section** looks at the **risk management system and risk management function** as basic components of the governance system under Solvency II. This system comprises strategies, processes, and information procedures needed to identify, measure, monitor, manage, and report the risks to which a company is or could be exposed as well as its interdependencies.

The risk management system should be integrated into the organisation's structure and into the company decision-making processes. To this end, companies should:

- identify their objectives and assess the risks that could prevent them from attaining those objectives,
- design internal controls and strategies to manage or mitigate those risks, and
- monitor the controls and strategies to ensure that they are operating effectively.

Insurance companies will, furthermore, put in place a risk management function that will serve to implement the risk management system. This function, together with the compliance, actuarial and internal audit functions, is one of the key functions under the Solvency II directive. The director of the function should therefore fulfil the fit and proper requirements needed to ensure proper performance of the function.

The key tasks of the risk management function are:

- To define the risk categories and the methods for measuring and managing them.
- To coordinate risk assessment and evaluation processes.
- To set risk tolerance limits for each type of risk in accordance with the company's overall risk profile.
- To formulate the scope and frequency of stress testing.
- To monitor compliance with action plans derived from risk management.
- To promote a risk management culture within the company.
- To assist upper management, the Board of Directors, and the other key functions with a view to effective operation of the risk management system.
- To report detailed information on risk exposure to the Board of Directors on a regular basis.
- To identify and evaluate emerging risks.
- To report all potentially major risks promptly.

The Guide includes a section on the role of the **Board of Directors** and **Delegated Committees** in the operation of the risk management system.

Insurance company Boards of Directors will bear final responsibility for:

- Ensuring the effectiveness of the risk management system.
- Setting the risk appetite and tolerance limits.
- Approving risk management strategies and policies.

Therefore, in the interest of performing the above duties, Boards will:

- Interact with the risk management function by proactively requesting information and questioning that information where appropriate.
- Document the decisions taken and the extent to which the information furnished by the risk management system has been taken into account.
- Ensure that the company has sufficient resources to perform the risk management function.
- Resolve any conflicts of interest that may arise.

The management body, as part of its duty to supervise the risk management system, will ensure that:

- Account is taken of all risks faced by the organisation in the pursuit of its objectives.
- The risks are appropriate to the organisation's objectives.
- Risk management systems are implemented and operate effectively.
- Information concerning those risks and its management is adequately reported.
- Authority, responsibility, and accountability are assigned to the appropriate levels within the organisation.

Company Boards of Directors commonly set up Delegated Committees to assist in the performance of their duties in this context. Organisations thus commonly establish Risk Committees or else assign these tasks to the Audit Committee. These Committees will:

- Ensure that all relevant information relating to risk management reaches the Board of Directors.
- Include risk supervision on the agendas for Committee meetings.
- Ensure that risk is a factor taken into consideration in all of the organisations decision-making.
- Review the risk map at least annually.
- Use internal controls to keep the risks faced by the company within the tolerance levels set by the Board commensurately with the benefit-cost ratio.
- Identify and understand emerging risks and hold meetings with the directors of the organisation's various business units to drive home the idea that they bear responsibility for effective risk management.

Section two of the Guide considers the **risk manager's role at each level of the risk management system**.

The risk management system will include:

- A risk management strategy consistent with the business strategy. Strategy's objectives, risk tolerance limits, and allocation of responsibilities will be documented.
- Decision-making procedures.
- Policies for defining and classifying risks and the risk tolerance limits for each type of risk.
- Procedures and information processes for monitoring and assessing significant risks and making changes when necessary.

Thus, all risk management systems can be seen to comprise the following five components:

- Strategy.
- Risk appetite.
- Risk Management Framework.
- Policies.
- Management and control processes and procedures.

Risk managers will perform the following tasks in connection with **strategy**:

- Identifying potential risks capable of jeopardising attainment of the stated strategy and objectives.
- Advising in respect of management actions should potential risks materialize.
- Monitoring fulfilment of the strategic plan within approved risk limits.
- Ad hoc analysis of corporate transactions.
- Advising on changes to the system of governance with a view to being able to achieve objectives.
- Ensuring that the concepts of capital and risk are considered in decision-making.
- Including the strategic plan in the ORSA process (i).

(i) ORSA (acronym for Own Risk Solvency Assessment) is the set of processes and procedures laid down by the EU Solvency II directive (Directive 2009/138/EC) to enable insurance and reinsurance companies to evaluate short-term and long-term risks they may have to face in the context of their internal capital availability and requirements.

Desired risk appetite is a key element in the risk strategy to be specified by the Board of Directors on the advice of the risk management function. Once it has been established, the risk management function will ensure regular monitoring of the level of appetite to make sure that the specified risk profile stays within the previously established levels of risk at any given time.

The risk appetite is the amount and type of risk the company is prepared to take on to achieve its objectives. It must be linked to the company's strategy and is a point of reference for business planning and decision-making. Setting this threshold makes it possible to optimise the relationship between risk and profitability.

To allow this global parameter to be put to practice use, it has to be broken down into more detailed limits suitable for applying specific, measurable day-to-day business management metrics.

Two further parameters also need to be defined:

- Risk tolerance, that is, the acceptable level of variation in the target risk appetite.
- Capacity, that is, the maximum level of risk the company can accept in achieving its objectives. Risk tolerance will act as a warning to prevent the company from reaching the level of its capacity, which would jeopardise solvency.

It is essential for risk managers to take the lead in regularly monitoring compliance with established risk limits.

The risk profile, i.e., the level of risk carried at the close of each period or at a given point in time, needs to be contrasted with the level of risk appetite approved by the Board of Directors.

Each risk is to be checked to see whether it is within the limit specified in the policies. If any limits are exceeded, the corresponding action plans are to be put forward and implemented so as to be able to stay within approved risk limits and intervals.

The results of regular comparison of the risk profile (the risks taken on at a given point in time) and the specified risk appetite are to be compiled in a report for submission to the Board, either directly or via Delegated Committees if there are any, for approval.

The **internal risk management and control framework** encompasses the risk management procedures and approaches to be implemented and employed within the company, resting on three essential pillars:

1. A suitable structure that clearly defines responsibilities in respect of risk ownership, control, and supervision. This structure will be embodied in functional and hierarchical organisation charts and in the corresponding information, reporting, and decision-making flows throughout the organisation.

2. Corporate policies that set the key operational principles aimed at attaining the stipulated objectives along with the risk limits and tolerance levels.

3. Structured and documented management procedures reported to the organisation that implement the company's management system and indicate how to carry out tasks and set up monitoring activities so as to mitigate risks. As the directive indicates, these monitoring activities should meet the requirement of being proportionate to the risks arising from the activities and processes being monitored.

The risk management framework is to be reviewed on a regular basis. Conducting the review annually is a best practice.

The set of **corporate policies** formulate the principles to be followed by the company in managing certain areas of risk and help ensure the attainment of business objectives and compliance with regulatory requirements in the territories where the company does business.

The policies should specify first and second-line responsibilities with regard to the content, assessment, approval, functioning, supervision, monitoring, and reporting of the policies. Another best practice is the direct involvement of the risk manager in drawing up a specific policy for risk management function, detailing its activities as a key supervisory function and its rights, obligations, relations, communication flows, and reporting throughout the organisation. This policy is to be approved by the Board of Directors and reviewed yearly.

The risk manager assists and advises the operational areas owning of the risks in drawing up the content of their individual risk policies. It is essential for the company to allocate responsibility for risk management and control to the risk owners.

The specific risk management policies should cover at least the risk areas referred to in the directive:

- Underwriting risk management and reserve constitution.
- Asset-liability management.
- Investment risk management.
- Liquidity risk management.
- Concentration risk management.
- Operational risk management.
- Reinsurance risk management and other risk mitigation techniques.

Risk management activities are to be transverse across all the company's processes, involving all the different operational areas of the company.

It is therefore essential to put in place **well-defined risk management and control procedures** that can identify, monitor, and measure the impact of the different risk categories. They should describe the areas responsible for managing and controlling each category, the frequency and scope of the controls and the situations that call for greater care, and a specific plan; they should also ensure that the risks are described and are known to the persons in the areas where they may occur.

The existence of these procedures, suitably documented, ensures that the system will be effective; enabling the company to stay within the risk limits set by the Board of Directors and thereby guarantee its solvency.

The risk management and control procedures established should encompass the following processes:

1. Drawing up a risk catalogue.

   Mapping the company's risks is the basic process for all risk management systems. Risk mapping may extend solely to operational risks or may also include reputation, strategic, compliance, business, financial, and other risks.

   A customary procedure for drawing up the risk catalogue consists of identifying risks by business area or by process (or vice versa, taking the process as the focus, irrespective of the particular business areas where the risks arise). The inherent impact and probability of occurrence of each risk is scored. A series of controls designed to mitigate the impact or frequency of occurrence are assigned for each risk, yielding a residual risk score. This scoring is used to monitor evolution of the risks.

   The catalogue may further include other risk-related details, such as the persons in charge of the various control procedures, associated action plans, key risk indicators or KRIs, key risk markers, and the like.

2. Identifying and updating the risks on an annual basis.

   The procedure for identifying and updating risks should span all the company's operational business areas and activities and consists of reviewing all the risks identified in the risk catalogue, verifying whether they remain current, where appropriate redefining or removing risks and allowing new risks to be added.

   The risk manager should approve any changes proposed by the various operational areas and then include them in the risk catalogue. This process includes updating processes and activities, risks, controls, and associated action plans. Any action plans regarded as appropriate to ensure that the company is in compliance with the specified risk appetite may also be included.

3. Regular risk assessment process.

   The regular assessment procedure will again involve all of the company's areas and its most important activities and consists of updating the scoring of the mapped residual risks and the level of effectiveness of the controls. This results in an updated map of the possible impact of the risks identified on management.

   The frequency of the process may be set on the basis of the priorities of the activities being monitored and whether they are business or support activities.

   The risk manager should provide the various operational areas with a way to report changes in their processes, risks, controls, and action plans and to carry out new self-assessments of existing risks and controls.

   The approach used to implement the three above-mentioned processes should be set down in writing in a risk management procedure manual.

4. Risk notification process.

   Interested parties may be notified of the findings of the above-mentioned processes by reports on the general internal risk management and control framework that include a description of the methods used to score the risks and controls and the annual scoring results.

   The frequency of these reports will be set in the risk management policy and may vary according to the criticality of the risks being assessed. Risk management activities must therefore be transverse, spanning all processes and involving all the company's operational areas.

The **third section** of the publication focuses attention particularly on the risk manager's role in the **ORSA process**, inasmuch as own risk and solvency assessment is an essential tool on which the entire risk management of insurance companies hinges.

The ORSA process plays an essential role in drawing up strategy and in business planning, since it furnishes an overview of the current and future risks to which the company could be exposed and of the unencumbered assets the entity needs to have available to be able to meet possible losses that could occur in the time horizon under consideration.

Risk managers, especially the director of the risk management function, play an essential role in the different stages of the ORSA process. The scope of their duties, together with the procedures and methods used to perform the ORSA analysis, data quality standards, and assessment frequency, should be set out in general fashion in the written policy for the process.

The ORSA results obtained should be compared with the company's risk appetite so that if any stipulated risk limits are going to be exceeded, the management measures planned for each individual case can be taken.

In accordance with Solvency II, the ORSA process should include at least:

(i) ascertaining the company's overall solvency needs having in mind all the risks inherent in its business with a view to proper short and long-term decision-making based on its capital requirements;
(ii) verifying ongoing compliance with capital requirements and technical provisions;
(iii) ascertaining the extent to which the company's risk profile deviates from the assumptions underlying the solvency capital requirement calculated using the standard formula.

The ORSA Report is to be submitted to the company's upper management and Board of Directors for validation and approval. It is to be sent to the supervisory authority (Spain's Direction-General for Insurance and Pension Funds [*Dirección General de Seguros y Fondos de Pensiones*]) within two weeks of completion (i.e., the date on which the report is approved by the management body). The recommendation is to submit the report by 30 June of the first year forecast in the report. The ORSA Report as approved will also be brought to the attention of the company's key personnel.

Section four of the Guide explains the risk manager's role in **various aspects coming under Solvency II**, e.g., its involvement in calculating the solvency capital and the minimum capital requirements, in complying with the disclosure and transparency requirements under Pillar III of Solvency II, as well as his/her role in particularities of the risk management function of insurance groups, and in outsourcing.

Given the current situation all companies are going through as a consequence of the COVID-19 pandemic, the **fifth and last section** of the Guide has considered it essential to address the role of risk management in cases of serious contingencies, that is, unexpected events that may pose a threat to business continuity. It presents a topical discussion of the risk manager's role in this connection, both in the period leading up to a contingency as the person in charge of securing the organisation's approval of the **Business Continuity Plan**, and during management of the actual contingency itself when it has occurred and afterwards, monitoring events until the organisation's business activities get back to running normally.

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