

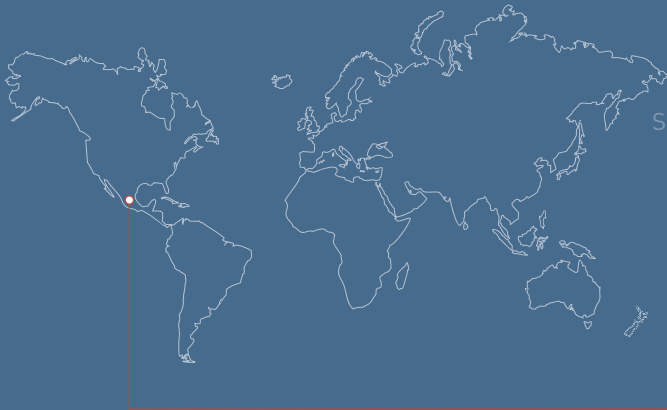
year XV / 2010

2010 Chile earthquake: science and insurance also evolving.

Ricardo Lozano: EU Spanish Presidency assessment from the insurance perspective.

Jesús Galeote: 25 years of active reinsurance.





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summary

03

editorial

04

2010 Chile earthquake: science and insurance also evolving

05 The 8.8 magnitude Maule, Chile, earthquake

John E. Alarcon
MEng (Civil Eng), MSc, PhD DIC
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18 The Chilean Earthquake and Tsunami: World's Second Most Expensive Earthquake for the Insurance Industry

Marcelo Ulloa
General Manager MAPFRE RE Chile

20 Insurance management the catastrophe risk

Juan Satrústegui
Natural Hazards MAPFRE RE - Madrid

22

interview:

Ricardo Lozano

Director-General of Insurance and Pension Funds in Spain

32

interview:

Jesús Galeote

Manager of the Asia, Africa and Australasia (AAA) geographical area
MAPFRE RE

39

agenda

editorial

2010 will be a difficult year to forget in Chile. During the early hours of the morning of 27 February, the inhabitants of the country's central region were awoken by an earthquake of major intensity. The disruption of activities in this region continued for several months. Estimates suggest that the rupture of the fault plane extended over a distance of 400 to 500 kilometers, and the waves of the tsunami that was generated immediately afterwards reached a maximum height of some 11 meters. The lessons learned from the earthquakes of 1960 in Valdivia and 1985 in Valparaíso were incorporated into strict regulations on earthquake-resistant design, which yielded obvious benefits in 2010. Significant damage was nevertheless inflicted on major elements of the infrastructure, making access to the afflicted zone even more difficult. As regards the earthquake's impact on the insurance and reinsurance market, the final total may well exceed the range from 8,000 to 10,000 million dollars, on account of coverage for losses due to business interruption cover and its interpretation. Another factor that is delaying the final assessment is the complex nature of loss adjustments for the large risks and mortgage portfolios, on which work is continuing. The spirit of unity shown by the Chilean people in the face of this huge disaster was another manifestation of the courage of a nation which -in a contrasting scenario- watched as the 33 miners who were trapped in the bowels of the earth for several weeks emerged one by one to safety. On behalf of TRÉBOL, we offer our congratulations to the entire country and in this issue, we are dedicating our whole section of articles to the single subject of the Maule earthquake.


June 2010 saw the end of Spain's presidency of the European Union, so TRÉBOL invited the Director-General of Insurance and Pension Funds in Spain to review the work undertaken in the insurance sector during this period. Although Solvency II was by far the most dominant subject at meetings of the national and European markets, Mr. Ricardo Lozano also analyzes the Spanish Law on Insurance Contracts, the Mediation Directive, Spain's standard scale for personal injuries and the way the crisis has impacted our sector. Despite the scope of the changes taking place in insurance activities -especially as regards supervision and financial strength- it is clear that progress is still being made towards the targeted objectives, thanks to cooperation among all the players in the system.

Good companies enable their employees to prosper, and good professionals play their part in the expansion of business activities. This was confirmed by our interview with Jesús Galeote to mark his 25 years with MAPFRE RE. During this period, he has acquired expertise in the various business areas of a reinsurance company; he describes experiences ranging from his temporary posting in Brussels to his regular visits to the distant markets of Australasia, the region for which he is currently responsible. Jesús Galeote's professionalism is a key factor in our company's future development.

Special

2010 Chile earthquake: science and insurance also evolving





The 8.8 magnitude Maule, Chile, earthquake Seismological review and field survey observations

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In 2010, a number of large-magnitude earthquakes hit populated areas, causing widespread destruction, large numbers of casualties, significant economic damage and high insured losses. Of these events, the Maule, Chile, earthquake of 27th February caused the greatest damage in terms of economic losses. This article addresses some of the seismological aspects related to this earthquake, describes the challenges of modelling the event for damage and loss estimation purposes, and presents some results from field observations obtained shortly after the earthquake. The article briefly explores how this event may have changed the seismic setting and the potential for future events in the Chilean region.



Valparaíso, Chile

What is really important for damage estimation is how close the exposures of interest are to the ruptured plane, than to the earthquake's epicentre

Introduction

Thus far, 2010 has seen a substantial number of earthquakes affecting urban populations. The first of these events took place on 10th January when a moment magnitude (Mw) 6.5 earthquake struck Northern California. Although the event occurred offshore and did not cause significant damage, it was a reminder to Californians and the insurance community of the high seismicity in the region. Two days later, on 12th January, Haiti was struck by a shallow earthquake that occurred close to its capital, Port-au-Prince. The 7.0 Mw event produced extensive damage to the city and a death toll of about 222,000 people. More than a million people were made homeless (USGS¹, 2010). A month and a half later, on 27th February, a powerful 8.8 Mw earthquake impacted a large swath of central Chile and, in particular, the Bío-Bío, Maule and Araucanía regions. The earthquake caused damage to the city of Concepción, the second largest populated urban area in the country. While claims are still developing, total insurance losses are expected to be high.

Other earthquakes of significance occurring during the course of the year were the 6.3 Mw event of 4th March in Taiwan that, while causing no major destruction, it reminded the population of the devastating 1999 Chi-Chi earthquake; the 6.1 Mw of 8th March in Karakocan, Turkey; the 7.2 Mw of 4th April in

Baja California that resulted in considerable damage to Mexicali, the capital of the Baja California state in Mexico; and most recently, the 7.0 Mw earthquake on 4th September in Christchurch, New Zealand, where large losses are expected to be partly paid out by the EQC (the New Zealand Earthquake Commission, which provides insurance coverage for natural disasters affecting residential property).

The unusual number of events affecting urban populations is not the result of an increment in the world seismicity during 2010, but is rather a consequence of the expansion of urban centres and hence, a larger exposure of urbanised areas to natural perils. Considering the importance of the Maule, Chile, earthquake for the (re)insurance market, this article reviews some seismological details of the event, the damage observed during a field survey, and briefly describes how this event may have influenced the seismic hazard in the region with respect to future earthquakes.

Event description

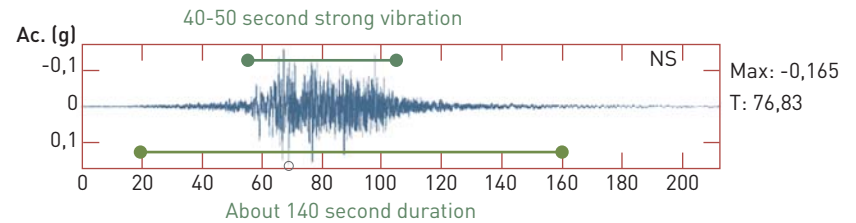
At 3:34 am local time (6:34 am UTC), a moment magnitude (Mw) 8.8 earthquake, occurring off the coast of central Chile, struck the regions of Valparaíso, Santiago Metropolitan area, O'Higgins, Maule, Bío-

¹ USGS -United States Geological Survey



Figure 1. Ground Motion recording from the Maule, Chile, earthquake

Total duration of the ground shaking was about 140 seconds with the strongest part lasting 40 to 50 seconds. Source: RENADIC (Red Nacional de Acelerógrafos de la Universidad de Chile - University of Chile National Network of Accelerographs)



Bío and Araucanía, causing extensive damage in Central Chile. The area affected by the earthquake roughly covered 700 km along the coast and reached 100 km inland. The seismic energy released during this event is about 22 times the energy released during the 7.9 Mw Pisco, Perú, earthquake of 2007, about 500 times the energy from the 7.0 Mw Haiti earthquake of 2010, and about 7,940 times the energy released during the 6.2 Mw L'Aquila, Italy, earthquake of 2009.

The damage caused by the ground motions was exacerbated in coastal areas by the tsunami that followed, which produced waves of up to 11 metres high. In Chile, where the higher tsunami run-ups were measured, the average wave height amongst 23 measurements was about 3.7 metres (NGDC², 2010). Even though the epicentre of the event (i.e. the point projection on the surface of the Earth of the point releasing the largest amount of energy during an earthquake) was initially located at 107 km from the city of Concepción and 328 km from Santiago de Chile, though the distances from these cities to the earthquake fault rupture plane were much smaller.

The earthquake-induced ground shaking was of very long duration (about 140 seconds) with the strongest part of it lasting between 40 to 50 seconds (see Figure 1). The induced horizontal accelerations in Concepción were

recorded as up to 6.4m/s^2 or roughly 65% of Earth's gravity. This means that some buildings in Concepción may have received, for a fraction of a second, lateral forces equivalent to 65% of their vertical weight.

The length and intensity of the ground shaking caused damage to structures ranging from old adobe houses to modern buildings made of reinforced concrete. The Chilean housing minister initially estimated 1.5 million houses to have been damaged to some degree, though more recent information from the Chilean government estimates this number on the order of 370,000. In most cases, damage to engineered buildings was largely restricted to non-structural elements, pointing to Chile's history of good design codes and construction practices. However, it must be noted that a small number of engineered buildings suffered severe or partial collapse. The earthquake also severely affected infrastructure, including roads, bridges, airports, utilities and telecommunication networks.

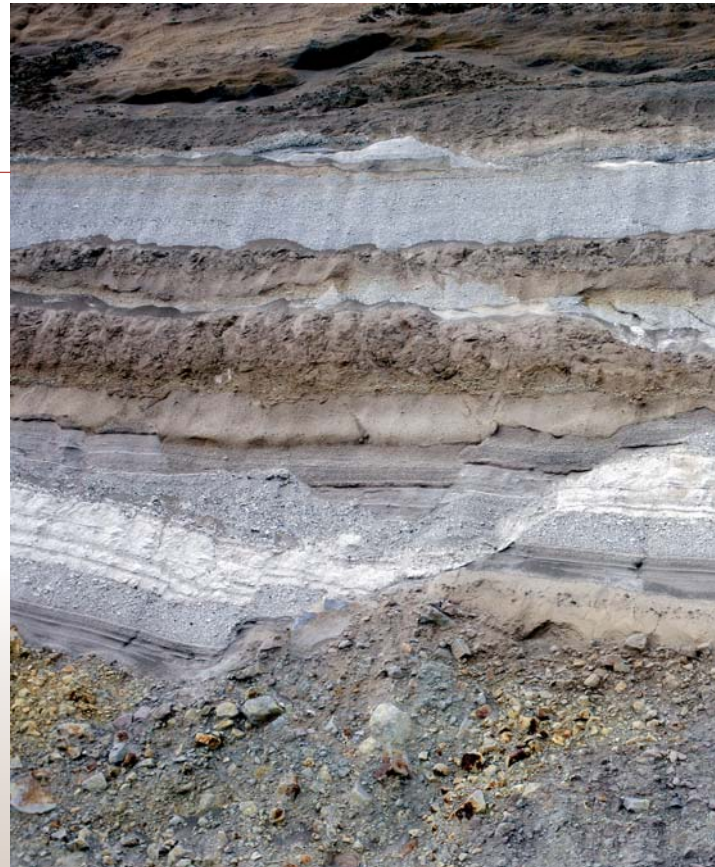
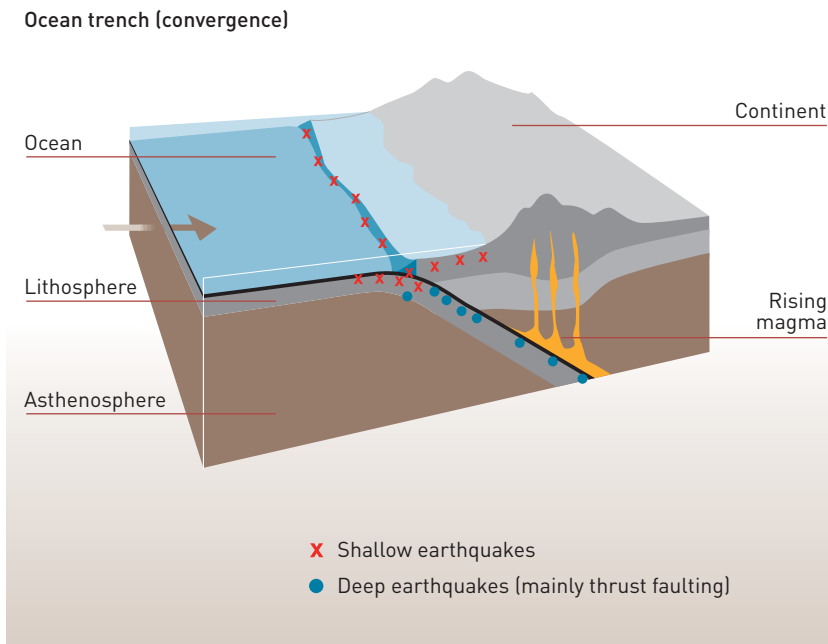
Tectonic setting

Chile is located on the so-called "Pacific Ring of Fire", which in essence represents the boundary between oceanic and surrounding continental tectonic plates in

² NGDC: USA National Geophysical Data Center.

Figure 2. General subduction process

The oceanic plate (left hand side plate) is pushed below the thicker continental plate (right hand side one). The collision of these plates deforms the continental plate, a process that often creates mountains ranges. Source: Bolt (2003)



Geological fault in strata of volcanic ash exposed in a road cutting

Figure 3. The largest recorded earthquakes have been produced in the Pacific Ring of Fire

The figure shows the 10 largest recorded events with year of occurrence and magnitude; the Maule earthquake is listed in fifth place. Source: AIR



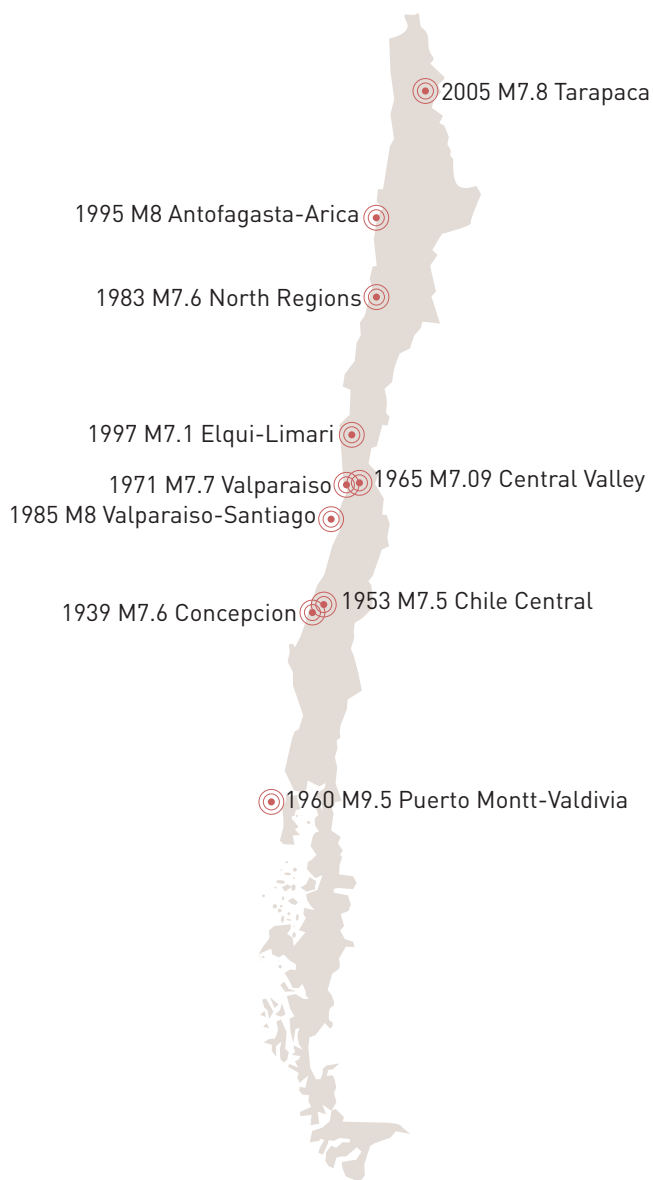
- | | |
|-----------------------------|-----------------------------------|
| 1 Chile, 1960: Mw 9.5 | 6 Ecuador, 1906: Mw 8.8 |
| 2 Alaska, 1964: Mw 9.2 | 7 Rat Islands, 1965: Mw 8.7 |
| 3 Sumatra, 2004: Mw 9.1-9.3 | 8 Sumatra, 2005: Mw 8.6 |
| 4 Kamchatka, 1952: Mw 9.0 | 9 Andreanof Islands, 1957: Mw 8.6 |
| 5 Chile, 2010: Mw 8.8 | 10 Tibet, 1980: Mw 8.6 |

the Pacific Ocean. In general terms, the thinner and denser oceanic plates are subducted below the thicker but lighter continental ones (see Figure 2).

The Pacific Ring of Fire (ROF) extends 40,000 km from Chile in South America to New Zealand in the Western Pacific (see figure 3). The collision of these enormous tectonic plates implies vast amounts of energy being accumulated and then suddenly released by what is known as an earthquake. The largest proportion of this energy is converted into heat and permanent deformation, as in the formation of mountains. Only about 5% of the total energy released is transformed into ground-shaking. The largest instrumentally recorded earthquakes have occurred in the Pacific Ring of Fire, and it is estimated that about 75% of the total seismic energy produced in the world per year is released along the ROF. Figure 3 also shows the ten largest instrumentally recorded events in the world, all of them located on the ROF. The largest recorded earthquake took place in 1960 in Chile, at



Figure 4. Locations of the ten largest historical earthquakes in terms of estimated losses were they to recur today
 (Source: AIR, 2009)



9.5 Mw, while the 2010 Maule earthquake ranks fifth.

The tectonic plates involved in the Ring of Fire collision in Chile are the oceanic Nazca plate and the continental South American plate. The Nazca plate is being subducted under the South American plate at a rate of about 80 mm per year. The Antarctic oceanic plate is also subducting beneath the South American plate in the southernmost part of Chile, though at a rate of 20 mm year and hence, the seismic activity in this region is much lower than along the Nazca-South American plate boundary.

Since 1973 Chile has been affected by thirteen earthquakes with magnitudes equal to or larger than 7.0 and Concepción, in particular, had already been severely affected during the 1939 7.6 Mw earthquake. Figure 4 shows the locations and magnitudes of the ten largest historical events in Chile prior to the Maule earthquake in terms of estimated losses if they were to recur today (AIR, 2009).

The challenges of modelling the Maule event

Estimating the damage caused by an earthquake in real time involves the assessment of the relevant seismological parameters (i.e. magnitude, the type and location of the event, and the geometry of the fault rupture as primary parameters), how the seismic energy released transits through the earth, the particular response of the type of soil at each particular site, the age of the building/infrastructure under

Design codes in earthquake-prone countries have been implemented and updated based on lessons learned from past damaging events



Osorno Volcano, Chile

assessment and the quality of the design and construction of the affected structures, among others. This section focuses on the challenges related to the assessment of the seismological parameters shortly after the event.

Table 1 provides the location of the epicentre given as latitude and longitude, the depth of the event (focal depth) and magnitude assigned by four different and respected seismological agencies from Chile, Germany,

USA and Europe. The data listed was issued soon after the event occurred, and was published on the internet on 2nd March, three days after the main shock.

The first striking difference comes from the magnitudes initially assigned, for which the UCSC (Chile) and the GFZ (Germany) provided initial estimates of 8.3 Mw, compared to the 8.8 Mw given by the USGS (USA) and the EMSC (Europe). This represents a difference of 5.6 times the size of the earthquake in terms of the energy released. Even though the 8.3 magnitudes were updated to 8.8 later on, this highlights the relevance of these initial differences in the estimation of damage and losses within 24 or 48 hours of the event.

The second divergence arises from the estimation of the epicentral location, where differences of up to about 50 km can be calculated from the table. Even though the estimation of the ground motion intensity induced at a certain distance from a seismic source is very complex, and includes the evaluation of soil conditions, topographical effects and rupture directivity among others, a difference of 50 km can have very different

Table 1. Earthquake parameters from the Maule event, as published on 2nd March at 10:00 am GMT. Red colour numbers show the data that was updated later on

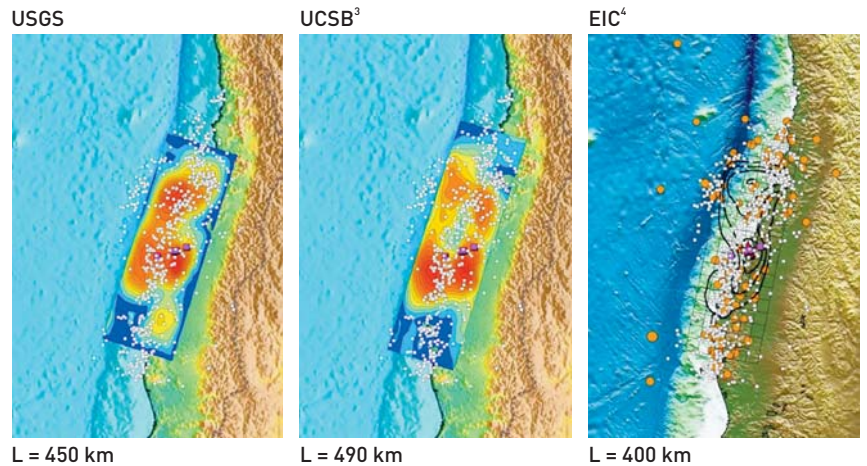
Agency	Epicentral location		Focal depth (km)	Magnitude Mw
	Latitude (S)	Longitude (W)		
UCSC (Chile)	36.208	72,963	47,4	8,3
EMSC (Europe)	35.89	73,04	30	8,8
GFZ (Germany)	36.04	72,66	30	8,3
USGS (EE.UU.)	35.846	72,719	35	8,8

Notes: UCSC – University of Chile Seismological Centre; EMSC – European-Mediterranean Seismological Centre; GFZ – German Research Centre for Geosciences; USGS – United States Geological Survey



Figure 5. Estimated fault plane ruptures reported by three seismological agencies: USGS (left), UCSB (centre) and EIC (right)

The rectangles in each figure represent the projection on the surface of the Earth of the earthquake fault rupture. Red colours represent areas of larger slips (i.e. larger releases of energy) while blue colours represent areas of the fault rupture with lower slips. The thick black lines in the EIC solution join areas of similar slip (Source: AIR)



³ University of California, Santa Bárbara

⁴ Earthquake Information Centre from Japan

consequences. All factors such as soil conditions being the same, in general, a moderate magnitude earthquake (e.g. around 6.5 Mw) being 50 km closer or farther from the epicentre may represent the difference between the total collapse and just light or no damage induced to a particular structure. While this example is a generalization, and the correlation between damage and epicentral distance is not quite so direct, the discrepancies in the estimated epicentral location soon after the event illustrates the uncertainties in the determination of seismic parameters.

The third parameter in Table 1 is the focal depth, which from the seismological point of view is the most difficult factor to determine with any level of accuracy and, hence, differences of around 10 km are usually found in published data from diverse seismological agencies.

The final aspect related to the Maule earthquake parameterisation is the definition of the actual fault rupture geometry which, together with the magnitude, is the most important parameter for the characterisation of an earthquake. It is also one of the most

challenging to quantify. An earthquake is not a single point inside the Earth (i.e. the hypocentre) releasing energy, but it is actually a full plane or area of contact between two tectonic plates (or two sides of an active fault) moving suddenly relative to one another in a very rapid displacement. In a subduction environment, this sudden slip between plates releases the energy accumulated through the collision of the tectonic plates. It is worth noting that this accumulation of energy occurs over decades, hundreds or even thousands of years before an earthquake is triggered.

The size of the ruptured plane varies proportionally with the size of the earthquake. The 7.0 Mw Christchurch, New Zealand, earthquake of September 2010, for example, ruptured a plane about 35 km long, while the 8.8 Mw Maule earthquake ruptured a plane about 450 km long. The estimated length of the plane ruptured during the 1960 9.5 Mw Chile earthquake was about 1,000 km.

Figure 5 presents the estimated ruptured planes for the Maule earthquake as reported by the United States Geological Survey

(USGS), the University of California (UCSB) and the Earthquake Information Centre (EIC) from Japan. The rectangles in each figure represent the projection on the surface of the Earth of the earthquake plane ruptured, while the colours represent the degree of rupture slip (i.e. the larger the slip the greater the amount of seismic energy released in that portion of the fault rupture). The EIC figure does not present a colour scale but lines that join points with similar slip. These lines are similar to isoseismic lines of damage, or to isobar lines in a weather map.

The estimated ruptured lengths from the USGS, UCSB and EIC are 450, 490 and 400 km respectively. Additionally, note that the location of the ruptured plane from the UCSB extends further to the North-East as

compared with the USGS solution, thus placing the fault plane closer to Santiago, Chile's capital. These results mean that using the latter scenario for damage and loss estimates will produce much larger estimates than using the USGS fault plane solution. Based on the previous discussion, it can be concluded that what is really important for damage estimation is how close the exposures of interest (e.g. buildings or infrastructure) are to the ruptured plane, than to the earthquake's epicentre.

In the end, the complexities involved in the determination of seismological parameters for rapid damage estimation are considerable, as is the amount of uncertainty involved in such assessment. How these uncertainties are dealt with is beyond the scope of this article.



Structural behaviour of buildings

Days after the Maule earthquake struck Chile, AIR Worldwide organised a damage field survey partly in collaboration with the Earthquake Engineering Research Institute (EERI). This section provides an overview of the structural behaviour of buildings in Chile during the earthquake and a brief history of the evolution of Chilean design and building practices.

Field Survey Observations

The team visited an area affected by the earthquake extending about 600 km along the coast and 100 km inland. Among the locations visited were Santiago, Valparaíso, Viña del Mar, Talca, Constitución, Concepción and Dichato.

In terms of damage to non-insurable buildings, an example of their structural behaviour was observed in the historical centre of Talca, the capital of the Maule Region. Here, residential buildings were predominantly made of adobe. About 1,500 adobe homes were either destroyed or were undergoing demolition at the time of the survey (Figure 6). These dramatic effects on adobe houses were also observed during the 2007, Pisco, Perú earthquake (Alarcon et al., 2008), highlighting the extreme vulnerability of unreinforced adobe to the lateral forces induced by the earthquake.

With respect to engineered buildings (considered, in general, as insurable), the majority of structures behaved very well, with only some exceptions. Examples of severe damage were observed in Concepción,



Figure 6. Collapse and demolition of adobe brick structures in Talca
(Source: AIR)

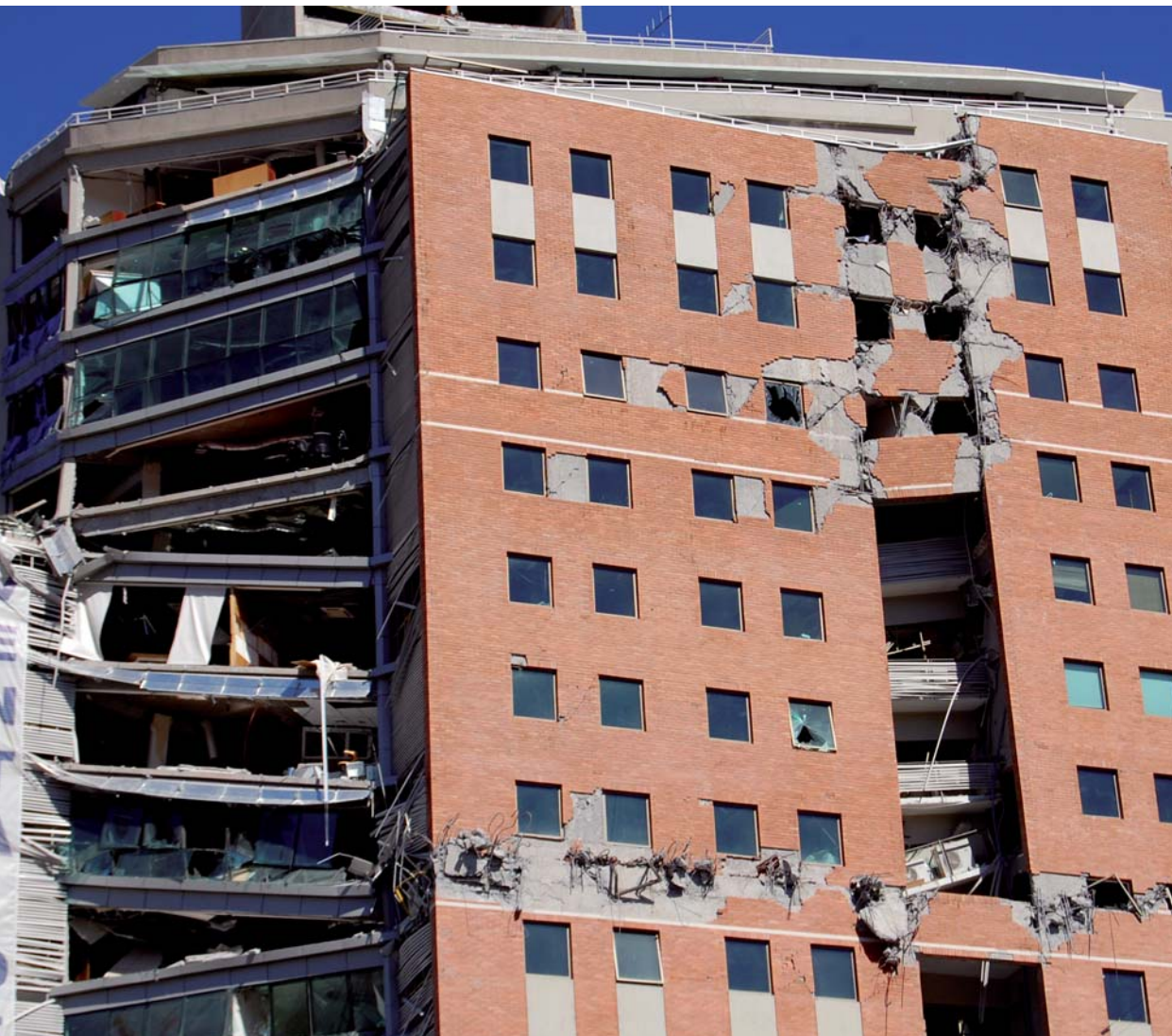


Figure 7. The Torre O'Higgins in Concepción

Figure 8. Fully collapsed building located in Concepción
(Source: AIR)



where several structures will have to be demolished due to partial collapses at localised floors. At the time of the visit, the city's municipality considered that a total of eight buildings had to be torn down, while an additional 48 would require in-depth inspections to assess whether they can be repaired. Currently, the number of buildings scheduled for demolition has generally increased, including those buildings that suffered severe although localised damage to their structures.

Although detailed studies are underway to discern the precise reasons why some modern structures failed in this earthquake, based on field observations it seems that the lack of vertical regularity might have been a key driver.

In general, vertical irregularities may appear in a structure due to set-backs in the upper floors or due to the differences in stiffness of vertical elements. One such case is the practice of reducing the cross-section of the vertical shear walls at the parking levels in order to provide more space for the manoeuvrability of automobiles. This induces a concentration of compression and tension stresses at these levels that, compounded with the flexion experienced during the earthquake, might have triggered the failure of vertical elements.

In Chile, engineered buildings significantly rely on shear walls. These are massive reinforced concrete walls within the structure that are designed to resist a large proportion of the lateral forces imposed by an earthquake. Much of the modern building stock performed well, but there were

exceptions where buildings suffered a partial collapse of concrete shear walls (Figure 9). Inspection of the longitudinal reinforcement of the walls suggested that the steel bars had suffered buckling due to excessive compressive stresses at the edges of the walls and due to insufficient confinement of the concrete. The confinement of the concrete at the edges of shear walls is typically known as a "boundary element" and it provides the wall with a higher capacity to resist earthquake loads. The absence of these boundary elements may have been largely responsible for the failure of vertical elements (see Figure 10).

The Chilean Design Code

As expected in earthquake-prone countries, design codes in Chile have been implemented and updated based on lessons learned from past damaging events. In other words, earthquakes that have hit areas where no previous design code existed induce significant damage to vulnerable structures not constructed to withstand the shaking and this leads to the revision of building practices. Once a new code is implemented, subsequent earthquakes will again highlight the shortcomings of new designs and through this iterative process a more resilient building stock ensues. Note that this evolutionary process can also be affected by gaps in the enforcement of building practices or by the introduction of new materials or techniques that can also result in the appearance of new vulnerabilities.

As described above, Chile has experienced a high number of large magnitude earthquakes and, as a result, the Chilean design code has been updated on a number of occasions. The first such code was implemented in the 1930s after the 1928 7.6 Mw Talca earthquake. Further revisions to the code were triggered after the 1939 Chillán earthquake, the 1960 Valdivia event (the largest earthquake ever recorded instrumentally) and the Valparaiso earthquake of 1985. Figure 11 summarises these events and the corresponding dates when updates were implemented to the code.



Figure 9. Partial collapse of shear walls
(Source: AIR)

Figure 10. Large buckling of the vertical reinforcement bars exacerbated by the lack of enough lateral, or confinement reinforcement
(Source: AIR)



Today, Chile's reinforced concrete design code is a very stringent one, essentially a local adoption of the United States ACI318-95 code, with a few exceptions.

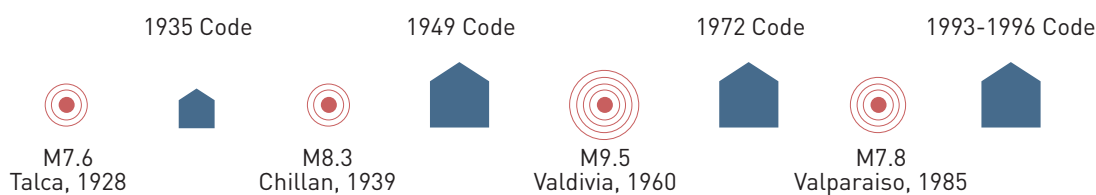
One such exception is related to not having fully implemented the US code concerning boundary elements in shear walls. This decision was made due to the historical practices of building strong and large cross-section vertical walls that had performed excellently in past events. However, this lack of boundary elements in conjunction with the continuous reduction of the cross-sectional

area of walls for architectural reasons has been pointed out during the analysis of this event as one of the potential causes of the damages observed to the modern building stock.

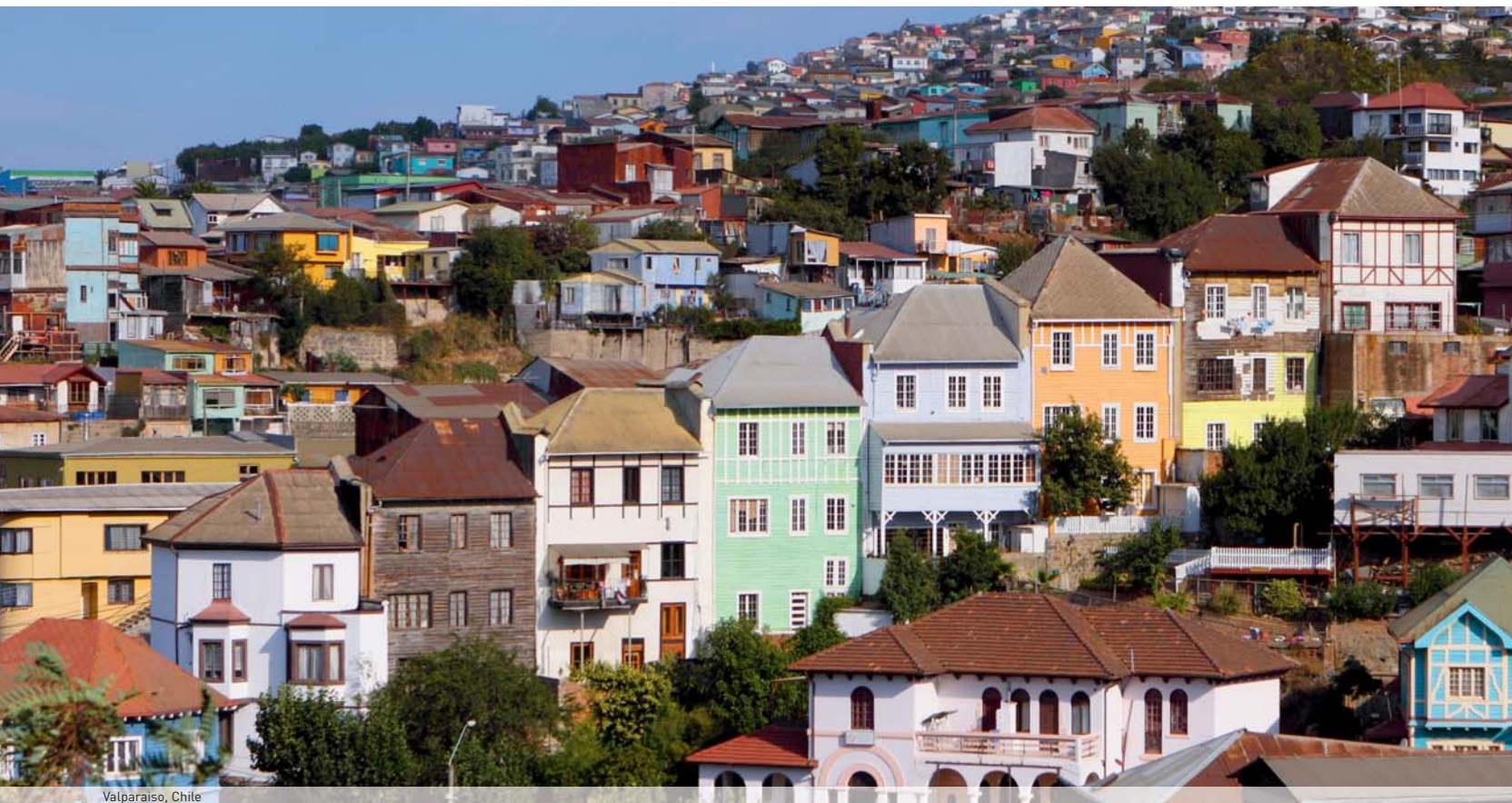
Chile has been quick to react to the lessons learned from the Maule earthquake (Franco and Siembieda, 2010). One of the most salient examples is a new draft for the amendment of the building code that revises the implementation of boundary elements, as well as increases in the design demands. The draft is scheduled for final governmental approval soon.

Figure 11. Evolution of the Chilean design code

The dates on top of the figure show the year of the updates, while dates at the bottom show the earthquakes that triggered the updates. The relative size of the structures reflects the comprehensiveness of the revision. (Source: AIR)



Valdivia, Chile



Valparaíso, Chile

Future earthquake hazard

Reliable seismic hazard evaluation involves very complex processes and requires several data as input that may not be available everywhere in the world. Where high quality information is available, the understanding of the regional seismicity is greatly improved but significant uncertainties nevertheless remain. No seismic “prediction” can be carried out with current technology. Instead, one must rely on probabilistic evaluations of the potential frequency and intensity of future events. Not surprisingly, the potential for future earthquakes in Chile remains a topic of study. This section depicts, at a high level, the potential influence that the Maule earthquake may have induced in the seismicity in the region.

With respect to future seismic hazard in Chile, it is important to address the notion of a “seismic gap”, which can be defined as an area in an active seismic region where the accumulation of stresses has occurred over a long period, but where no major

earthquake has occurred recently and thus an event is considered “due”. The Maule earthquake released energy that had been accumulated for about 170 years, filling in a previously observed seismic gap in the region. For this particular area and based on GPS measurements, Ruegg et al. (2009) had estimated that an event around Concepción with magnitude between 8.0 to 8.5 may have been due to occur. The Mw 8.8 Maule earthquake was even larger than Ruegg et al. (2009) had estimated.

As a consequence of the energy released during the Maule earthquake, tectonic plate stresses may have been transferred to the fault segments located immediately North and South from the rupture plane (see Figure 5). If so, this would suggest that the occurrence of an earthquake on these segments is now more likely. However, in this respect Shen-Tu and Mahdyiar (2010) point out the fact that large magnitude events have already occurred recently (within about 70 years) on these segments, and hence these may not yet be sufficiently

A new draft of the Chilean Building Code that increases the design demands is scheduled for final governmental approval soon



“mature” to rupture again with a large magnitude earthquake in the short term. With respect to other regions in Chile, Shen-Tu and Mahdyiar (2010) highlight the existence of two potential seismic gaps further North from the Maule region, in the Arica and Tarapacá regions, close to the border with Perú. The last time a large magnitude event occurred in these regions was in 1868 and 1877, with corresponding magnitudes of 8.8 Mw and 8.3 Mw, respectively.

Further details on the assessment of earthquake risk after the February 2010 event are available in Shen-Tu and Mahdyiar (2010), where a number of approaches are reviewed. What can certainly be concluded is that due to the tectonic setting and seismic activity around Chile, large magnitude earthquakes have occurred in the past and will undoubtedly occur in the future. Estimates of when these events might occur and how big they might be are exactly the challenges that the scientific community faces.

Conclusions

The Maule earthquake is, so far, the natural catastrophe producing the largest insured losses of 2010. The event occurred in a region of high seismicity and where large magnitude events have historically taken place. In this sense, it is expected that large magnitude events will occur again in Chile in the future. For this reason, Chilean authorities have developed a stringent seismic design code and implemented good construction practices that, with few exceptions, produced adequate structural performance of buildings during the 8.8 Mw earthquake.

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Two potential seismic gaps further North from the Maule region, in the Arica and Tarapacá regions, close to the border with Perú, have been highlighted



Santiago de Chile

The Chilean Earthquake and Tsunami: World's Second Most Expensive Earthquake for the Insurance Industry

Marcelo Ulloa
General Manager MAPFRE RE Chile

Cost to the insurance industry

According to estimates, the earthquake that rocked Chile on 27 February 2010 will cost the insurance and reinsurance industry between USD 8,000 and 10,000 million. The cost has to be stated as a range due to the difficulty of assessing the damage caused by the Business Interruption cover that affected industrial risks. Quantifying and appraising the damage in terms of lost productive activity is proving to be a complex task, given that there is no uniformity of wording for the clauses relating to cover of this type.

Almost all of these losses will be borne by the global reinsurance companies, because the local insurers transfer these risks to them on account of their catastrophic character.

Volume of claims filed

The insurance companies' local structures were never expected to deal with the numbers of claims that have been filed. According to figures issued by the Chilean Superintendency of Securities and Insurance (Superintendencia



de Valores y Seguros, SVS) on 31 August 2010, the number of claims had reached 222,065 of which 190,199 involve residential risks and 31,866 relate to losses on risks outside the residential sector, such as offices, commercial risks or other businesses. These figures represent more than eight years of claims for the fire line, creating a situation that has tested (and indeed stressed) the capacity of insurance companies and adjusters to respond to such an enormous level of demand. They have been forced to draw on vast quantities of human and IT resources in order to complete the required settlement and payment procedures in due time and manner.

Relationship to premiums

It has become obvious that the rates for catastrophe lines were insufficient in view of the economic and financial impact on the insurance sector and the insureds. The costs of the earthquake and the subsequent tsunami far exceeded the sums collected in catastrophe premiums during the last 30 years. The reinsurance industry reacted by adjusting the terms and conditions offered for renewals after

this unfortunate event, for proportional as well as non-proportional contracts; this was done by increasing rates, reducing commissions and setting limits per event and contract period, among other measures.

Analysis of portfolios

This experience again made it clear that there is no homogeneity among the various portfolios and cedents as regards their profile/exposure to events of this sort; until now, of course, reinsurance premium contributions were treated in a manner more akin to commodities, with no notable differences in terms and conditions, especially in Cat XL treaties.

Catastrophe capacity

Despite the numerous losses sustained by the reinsurers, there has been no visible reduction of the catastrophe capacity available for the local market. This fact is highly relevant for Chile in view of the economic and social role that is played by the reinsurance industry.



Insurance management of catastrophe risk

Juan Satrústegui
Natural Hazards MAPFRE RE – Madrid

After the Chile earthquake of 27/2/2010, some interesting thoughts are emerging on aspects relating to management of the catastrophe risk:

- ▶ The fault rupture occurred over an area measuring more than 400 x 100 kilometres. The Chilean insurance sector traditionally considers high-intensity earthquake scenarios, but for a more limited geographical area affected. It is common for many catastrophe reinsurance treaties to parameterise their capacity with respect to their aggregates in CRESTA zone III, or in zones II+III. Obviously, these are control zones, given that most of the country's exposure is concentrated there. But it would not be inappropriate to operate with wider scenarios affecting not only this group of zones but also adjacent regions.
- ▶ Naturally, different portfolios of insured risks have experienced different claims behaviour, due amongst other things to their composition in terms of class of business, the exact geographical location of risks, the type and year of construction of structures and the type of insurance.
 - ▶ Residential risks: although these generally show more homogeneous vulnerability, the year of construction and the type of insurance (more limited cover in some mortgage insurances) also affect the final amount of loss.
 - ▶ Commercial risks: these are by definition more heterogeneous, given that their

vulnerability is conditional upon the type of activity (structure and contents).

- ▶ Industrial and engineering risks: Regions VII and VIII are very industrial, and many mega-industries were therefore seriously affected by the earthquake. The main losses were due not only to damage to buildings and contents, caused either by the quake or the tsunami which lashed the coasts of Maule and Biobío, but also to Business Interruption (BI) cover. Some individual losses incurred by these industries -and they are still being quantified- are going to run into hundreds of millions of USD.
- ▶ Earthquake loss scenarios do not tend to contemplate the risk of tsunami and earthquake together in any country. Given the historical frequency of earthquakes with a magnitude greater than Mw 8 in Chile, it is likely that other major earthquakes happening in Chile in the future will also be accompanied by tsunamis.
- ▶ In general, the Chilean insurance market is improving the detail and processing of information on sums insured making up its earthquake exposure and sharing this with its reinsurers. Better information contributes to better assessment of the risk for everyone, especially using the catastrophe risk models available nowadays. In Europe -with the impetus from Solvency II- and also in various countries in Latin America, the guidelines on catastrophe reserving are accordingly being reviewed, with calls being made for models to be used to estimate the individual risk of each portfolio for a certain return period, and for them to be fed with detailed data on portfolios, so that they can be adapted as much as possible to the portfolios' characteristics. In this way the high figure for aggregates currently allocated to CRESTA Zone VI (Floating) will also be reduced, with many risks instead being included in the actual zones where they are located.
- ▶ The Chilean Securities and Insurance Supervisory Authority's regulations on the setting-up of earthquake catastrophe reserves by insurers date from 1993. These

CRESTA map of earthquake zones in Chile



CRESTA- Catastrophe Risk Evaluating and Standardizing Target Accumulations
<https://www.cresta.org>

regulations require insurance companies to establish a reserve based on the amounts for the most exposed CRESTA zone, applying a PML of 10% for material damage and of 15% for engineering risks and BI covers, less reinsurance and plus a 10% safety margin. Although it is possible that these regulations will continue to be sufficient, making the most of the large quantity of figures available after this big earthquake, the sector is currently bringing the regulations up for discussion and the various agents are in talks to develop them further.



interview to **Ricardo Lozano**

Director-General of Insurance
and Pension Funds in Spain



Ricardo Lozano was born in December, 1962. He graduated in law from the University of Alcalá de Henares in 1986 and went on to obtain his doctorate of law from the Complutense University of Madrid in 1996. He also obtained a degree in actuarial and financial studies from the University of Alcalá de Henares in 1998. In 1991, he passed the public examination to become a State Inspector of Insurance, and has been a State Inspector of Finance since 2000.

Between 2002 and May, 2004, he held the post of Manager of Financial Advisory Services for Insurance Companies with KPMG, the auditing and consultancy company.

At the proposal of the Minister of Economy and Finance and on the basis of Royal Decree 1279/2004 dated 21 May, he was appointed as Director-General of Insurance and Pension Funds; by virtue of this appointment, he also became chairman of the Insurance Compensation Consortium, a corporation established under public law which operates privately.

“It is important to highlight the strength shown by the insurance sector during the recent crisis”

The Spanish insurance sector is passing through an exceptional period. On the one hand, it is weathering the impact of the global financial and economic crisis with equanimity, despite the marked slowdown in growth; and on the other, as in the rest of Europe, it is fully occupied with the task of adapting to the new financial methodology imposed by Solvency II, which must be in place by January 2013. Spain held the Presidency of the European Union for the first six months of 2010. Now that this term of office has been completed, we asked Ricardo Lozano, Director-General of Insurance and Pension Funds, about the progress that has been made, his vision for the Spanish insurance industry and the roadmap for dealing with some of the key pending issues.

Spain held the Presidency of the European Union for the first six months of 2010. Which aspects stand out in terms of the work accomplished in the insurance sector?

The Spanish Presidency's role focused mainly on continuing the discussion of the draft for Solvency II and the Level 2 measures, following the approval of the Solvency II Directive.

What is Solvency II?

It is a new system of requirements for capital adequacy, and a code of conduct for the insurance companies as they carry out their activities. It is being set up for the entire European insurance sector. Solvency II is similar to the framework that was adopted for the banking industry some years ago -the Basel Accords, which are being updated at the moment. Having had several regulatory frameworks to standardize solvency requirements over the last 30 years, the insurance sector has now



tackled the job that was necessary: an update of the entire methodology for approving these new solvency requirements. But Solvency II also incorporates some other important ideas such as market transparency that is to say, more information from the supervisory authorities as well as the companies, for the insured parties as well as the general public. Ultimately, Solvency II entails the development of a methodology that is more appropriate to the risk profile of each individual company. More



efficient insurers will need less capital and will be subject to fewer requirements. On the other hand, a less efficient company, or one that takes on more risks, is likely to encounter greater difficulties with its commitments and will require more capital. At the same time, a series of rules is being brought in to improve all aspects of corporate governance, transparency and information.

How will these changes affect supervision?

There are two aspects on which Solvency II does not focus: one of them is the financial architecture of supervision. The Spanish Presidency played a clear part in pressing ahead with the establishment of the new supervisory bodies that will operate at financial level in the future. There are also some aspects of work that relate to Level II. There are prece-

dents in the Framework Directive regarding supervisory bodies or systems for multinationals and financial conglomerates. As regards these two issues, some aspects fall more within the scope of Solvency II and the Level II measures, whereas others are of a more generic nature.

Was there a specific Spanish initiative in connection with the new Directives?

No initiative was launched during the six months of the Spanish Presidency, because the objective was to ensure the continuity of the work in progress. At present, the Commission has a fixed timeline in place for the pending issues such as insurance mediation; a new Directive on this aspect is planned for the start of 2011. The main effort is focused on the work related to Solvency II.



And what about the issue of a new financial supervisory model for Europe?

Last summer saw the approval of a European supervisory model based on three specialized authorities: for banking, insurance and markets. Given that the scope comprises the 27 member countries of the European Union (EU), different supervisory models are emerging; there will certainly be some new features, and the frameworks that are currently in place will be modified and restructured. Ultimately, this is a problem of design and assignment of authorities. The existence of three Community supervisory agencies is perfectly compatible with differences among the supervisory models at the level of each individual country.

As far as Spain is concerned, is the government still thinking of changing the current

system and reducing the three supervisory agencies back to only two?

There is no proposal on the table at present. And also, the point that keeps coming up is that the overall situation of the financial system calls first and foremost for solutions to the most urgent issues. For example, a start has been made on reorganizing the savings banks. Once this process has been completed, the discussion will again turn to new supervisory scenarios.

Do you think that Spanish insurers will run into major problems as they adapt to Solvency II? Are there differences in the ways that large, midsize and small firms will have to adapt?

There are challenges, rather than problems. After all, this involves a spectacular leap in terms of quality. We are trying to involve as many companies as possible in the impact studies, so that managers can precisely identify the requirements that Solvency II will impose on them, allowing them to work on the planning. UNESPA (*Unión Española de Entidades Aseguradoras y Reaseguradoras*, Spanish Union of Insurance and Reinsurance Companies) is cooperating to the maximum extent in this area, as is my organization and also the *Confederación Española de Mutualidades de Previsión Social* (Spanish Confederation of Mutual Provident Societies).

In your view, will this prompt a new wave of consolidation or concentration in the sector?

Not necessarily. That will depend on many decisions, and on the managers that is to say, on whether they will be able to cope with the challenges of Solvency II. There will be a threshold level for smaller-sized companies without a "European passport" they will not have to comply with sophisticated regulations such as those which Solvency II may impose, so this will not necessarily lead to concentration.

As regards the implementation of Solvency II, for which impact tests are being conducted at regular intervals, there is a timeline that assumes everything will be ready by the end of 2012. Are Spanish insurers going to meet the deadline?

We shall try to but obviously, issues may arise as the project progresses and we shall have to take them as they come. The cooperation

No initiative was launched during the six months of the Spanish Presidency, because the objective was to ensure the continuity of the work in progress

Insurance in the Spanish market volume of gross accrued premiums
(Figures in EUR million)

	2005	2006	2007	2008	2009*	Variation 09/08 (%)
Total for Sector	48,950	53,255	55,078	59,447	60,374	1.56
Life insurance	20,617	22,950	23,246	26,850	28,538	6.29
Non-Life insurance	28,333	30,306	31,832	32,597	31,836	-2.33
Total insurance companies	312	298	297	296	294	

* Provisional data
Not including Mutual Provident Societies
Source: Directorate-General of Insurance and Pension Funds (D.G.S.F.P.)



Solvency II aims to bring the management models closer and those who do a better job of managing risk require less capital

shown by UNESPA, the sector association, is exceptionally good. It is sending out a very clear message, and the work is excellently planned. It is making a great effort to convince the entire sector and to ensure that everyone participates. It has a roadmap, and it has identified in detail the requirements that Solvency II will entail for the companies. We are holding regular meetings with the sector to offer suggestions, clarify issues and clear up any doubts. We are also making major efforts in our own organization. The Supervisory Law is being drafted in stages; at the recent con-

sultative meeting of last 20th July, we saw a new section of the draft. Everything is being done in order to achieve the objective. Once it has become a draft law, it must be adopted by the Congress of Deputies (Spanish Lower House) but in any case, the aim is to push ahead with it as far as possible.

The International Insurance Society (IIS) held its 46th annual seminar in Madrid. What were the outstanding subjects discussed at this event?
There was much talk about Solvency II, solvency models and capital adequacy calculations

for the various insurance lines. There was also quite an interesting discussion about the two zones of influence, the American and the European. Solvency II aims to bring the management models for both zones closer together. Its philosophy and methodology are based on risk. Accordingly, those who do a better job of managing risk require less capital. But the European methodology has been preferred because its antecedents are taken from other models such as those of Canada, the USA or Switzerland. Also, the methodological options are more finely differentiated, as are the various impact tests that are being conducted.

Another important issue for Spain is the current situation regarding the future Law on Insurance Contracts.

A process is in place to make headway with this legislation, but it will retain a structure that has been in operation for many years, since the existing Law on Insurance Contracts dates from 1980. Generally speaking, what is under way is an updating process, given that this is a commercial contract with general terms and clauses. There are numerous aspects related to case law, and controversial points that come up time after time the wording and the language that are used, to take one example. The technical wording is inseparable from the society in which we live, but we have to provide explanations so that balanced interpretations will be possible later on. And the linguistic aspects are determined by the scope of the official languages that are in force.

Is there anything outstanding as regards the future Law on Insurance Contracts?

No, I think that in overall terms, it has covered (or has attempted to cover) every aspect. Some points were missing, such as death and dependents' insurance. Certain improvements will be introduced in the area of consumer protection; for example, refusal of extension will not be permitted.

And what about insurance on the internet?

This is more a matter of distribution and channels, but all aspects of information prior to entering into a contract will be covered in an Annex to the Law on Insurance Contracts. The process involves updating all the relevant standardization. Now we would like to discuss and

debate this with the sector, and this is a process that moves slowly.

The crisis that we are passing through, which is to some extent structural in nature, has triggered a reduction in state revenues and cutbacks in social benefits. Will this situation offer an opportunity for private insurance, for example if private saving increases in an attempt to complement public-sector pensions?

We always try to take the view that the capacity of the private sector must be increased to respond to society's requirements. I am convinced that there is a need for balance, and

	Non-Life insurance	
	2009	2008
Status of Non-Life solvency margin (Figures in EUR million)		
Own assets	17,150	16,181
Minimum amount Solvency Margin	5,047	5,051
Difference (surplus)	12,103	11,130
Technical reserve cover (Non-Life) (Figures in EUR million)		
Technical reserves to be covered	32,268	33,100
Assets allocated	44,396	43,675
Difference (surplus)	12,128	10,575

Source: Directorate-General of Insurance and Pension Funds (D.G.S.F.P.)

	Life insurance	
	2009	2008
Status of Life solvency margin (Figures in EUR million)		
Own assets	13,311	11,817
Minimum amount Solvency Margin	6,333	5,715
Difference (surplus)	6,978	6,102
Technical reserve cover (Life) (Figures in EUR million)		
Reserves to be covered	136,873	129,251
Assets allocated	159,025	149,644
Difference (surplus)	22,152	20,663

Source: Directorate-General of Insurance and Pension Funds (D.G.S.F.P.)



**The insurance sector
is bearing up
to the crisis well**

hence for active participation, between the public and private sectors. This is one of the most important achievements of European society. Logically, complex situations may arise for each party, but overcoming these problems calls for a global effort by society as a whole, while respecting the various interests that are always involved.

We take the view that the public/private dichotomy has so far made it possible to develop a welfare "formula" of a reasonably high standard, enabling people to aim for increasingly satisfactory standards of living; but clearly, we shall have to see whether all the aspects are sustainable.

As an EU member, Spain has a regulatory framework for insurance that is based on European standards. What are the repercussions of this for the Latin American markets? How do they view us?

I think that they have a very special and very fond view of us. For instance, we take the time to work with those who request our help and we have frequent contacts and exchanges of information with them. Obviously, our relations within Europe are easier and more regular,

because we participate in ongoing work with the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) and the European Commission. As regards Latin America, the relationship is definitely very fluid. Suffice it to say that Mexico has been expressing interest in implementing Solvency II in its market for some time now. And generally speaking, the other Latin American countries are backing a line that will bring them close to us. We are their point of contact with Europe.

Why do we not have more Spanish insurance multinationals?

There are many reasons for this, starting with the fact that the size of the Spanish insurance industry has always been relatively small except in the last ten years, when it accomplished a major leap forwards. The history of the insurance industry has generally been very complex, and it has rarely been possible to count on companies having sufficient capacity to embark on international ventures. Nor has there been much support from the administrative side. Of course, recent years have seen some relevant changes. There have been some



significant changes to the law. There has also been an increase in the number of strong companies and operators, which would imply a trend towards seeking business abroad. However, it is important to highlight the strength shown by the insurance sector in the recent crisis, and its capacity to respond to the situation especially on the part of the credit companies, which were faced with enormous difficulties that proceeded to grow worse every day. We are good listeners, we are receptive towards all innovative projects, and I think that there are very few cases where a procedure for authorizing a new line of business has not come to fruition.

Is the 'per capita' premium ratio in Spain going to register a continuous increase?

Yes; the point here is that there will be no enormous leaps. Many factors have a bearing on this: culture, education, necessities and savings capacity, for example. Development will be based on day-to-day work and gradual progress. It will be a matter of motivating companies to continue to grow, while encouraging the general public to put their trust in insurance as part of the solution to their problems.

The impact of the crisis

How is the insurance sector bearing up to the crisis?

Generally speaking, it is bearing up well. As logically, all the European supervisory authorities have been following the situation closely. We were repeatedly asked for information; solvency tests were carried out in various Spanish groups, and the results are available. In some cases, the data for 2009 were actually better than those for 2008. It was possible to confirm that the sector has the right capacity to react to the difficulties that confronted it. There were merely some isolated problems in connection with credit insurance, which is obviously cyclical in nature; the ratio of claims to premiums took a nose-dive here. This led to a plan for some measure of public support from the Insurance Compensation Consortium (*Consortio de Compensación de Seguros*).

Is credit insurance from public companies such as CESCE (*Compañía Española de Seguros de Crédito a la Exportación*, Spanish Export Credit Insurance Company) supporting the ICO (*Instituto de Crédito Oficial*, Official Credit Institute) in any way?

No, that is still an open question. What we have seen is the possibility of making it easier for credit providers and clients wanting credit insurance to move closer together. The ICO is a facilitator of credit, not of credit insurance, but a rapprochement could stimulate business in such a way as to resolve doubts on the demand side as well as the supply side. In this respect, it is true that various initiatives have been tabled which could be channeled through the ICO.



The cooperation shown by UNESPA, the sector association, is exceptionally good in Solvency II implementation

Standard scale for physical injuries

The standard scale for personal injuries used by the Spanish insurance sector is the only one in the European Union which is stipulated at legislative level. What progress is being made with updating it?

This has been a very positive factor for the sector in Spain. There are various elements involved in updating the scale: the quantitative aspects, the development of medical aspects that enable recovery and reduce the after-effects, and also legal questions such as: who are the beneficiaries, how can they get the compensation payments, and to whom is the compensation due? Questions of this sort are more legal in nature.

Compensation payments to victims of serious injuries are not very generous. There are major differences between payments made in Spain and in other European countries.

This may be one of the questions that needs to be resolved. The members of the working group will be sensitive to this issue, and proposals will be made that take account of the efforts to raise the Spanish public's awareness of all aspects of road safety.

Is the updating of the compensation limits for mandatory motor vehicle liability insurance not going to trigger the cancellation of many voluntary liability covers?

There is no need for these covers to disappear. To be sure, the new limits are very high, but we should also remember that the objective here is to provide insurance that really does cover the consequences of a driver's actions in traffic. This is the aim that is being pursued in Europe, and it is also being incorporated into Spanish law: it is an attempt to ensure that anyone who

Insurance mediation

What stage have we reached with the new Mediation Directive that will be implemented in the future?

The European Commission has forwarded an ambitious draft to us. The work will focus on issues of remuneration, which are the bone of contention in every country.

Will commission be the basis?

There are many different formulas. We are proposing some approaches involving thresholds based on the premium, or at the request of the insured.

Will discounts be banned?

Yes. In fact, they are already banned in many countries, including Spain. On this matter, we shall have to arrive at a relatively balanced solution. Afterwards, it may also be necessary to arrive at a more accurate estimate of the figures that could work on the market. These are the most important issues. In any case, we are talking about a Mediation Directive for which the proposal will be submitted in the first half of next year. Discussion of it may

take some time, and that will be followed by the start of a transitional period.

Is there any work in progress aimed at differentiating or completely separating banking and insurance activities? After some difficult experiences, Canada decided to prohibit the distribution of insurance by the banks.

We are aware that there is concern on the part of the intermediaries, and even a confrontational situation to some extent. As we have said on many occasions, the point is that we already have a regulatory framework. Obviously, we oppose anything that resembles the imposition of an insurance contract, no matter by whom. We have heard evidence from various mediation associations and we have noted that they make generalized complaints, but they have never submitted any specific cases of persons on whom an insurance contract has been forced. We should aim to find reasonable solutions and conditions, and to establish a balanced situation between the parties. But what we usually point out to them is that the solution clearly goes beyond the bounds of the insurance sector. If we

has insurance will be covered by it for the consequences.

But is it normal for there to be a European Directive that sets maximum death or accident limits for motor insurance, and then for the Spanish Standard Scale for Physical Injuries to make substantial reductions to the figures stated in the Directive?

We are aware that the reform involves two stages, and we are quite insistent about the need to update the Standard Scale. We have two options: to increase the limits per victim, with the system that we used to have a few years back, or to change over to majority European usage, i.e. to set specific limits per claim. Basically, we are opting to adapt to the European system, so an update of the scale is needed in order to do this.



want to ban a bank from selling insurance in its branches, we have to take on the banking sector and obtain a ruling at legislative level. I do not know whether the Canadian model would be a solution, or whether it would make the problems even worse. Here in our banking industry, we have some excellent insurance professionals. Many of them used to work in the insurance world and they have joined the banking sector to do the same work. I think that generalizations are sometimes unjustified; however, the matter is open for discussion.

When it comes to the distribution of insurance, some systems will prevail over others. Do you think that bancassurance has an advantage because of the potential resources available to it?

Our view is that it is a good thing for the Spanish public to have different channels, and for those channels to become stronger. We cannot see that it would be better to have one single channel, because more distribution channels mean more expertise, so more information will flow onto the market. There will be greater scope for choice.





interview to **Jesús Galeote**

Jesús Galeote, Manager of the Asia, Africa and Australasia (AAA) geographical area
MAPFRE RE



Shinjuku, Tokyo, Japan

Jesús Galeote Ferrero was born in Madrid on 7 February 1960. He graduated in 1984 from the Complutense University of Madrid, where he had studied Economics and Business Studies, specialising in Econometric Analysis and Quantitative Economics. He speaks four languages.

He started his career at MAPFRE, Servicios de Reaseguro, in October 1985 after contacting the company in response to a newspaper advertisement. *"I joined the company because they needed to replace someone who was working in facultative reinsurance. They trained me for a month and a half - and then it was down to work"*, he comments. From then on, his career would take him ever upwards; from being Assistant Underwriter for facultative business in Spain he went on to write non-proportional treaties all over the world. 1987 saw the establishment of MAPFRE XL, Compañía Internacional de Reaseguros, S.A., where he continued with this task until, in 1990, he became a non-proportional treaty underwriter for the United States, Asia, Spain and Portugal. In 1992 he was appointed Deputy Manager of the [Reinsurance] Protection and Retrocession Department.

In 1994 he was transferred to Brussels as Technical Manager of CIAR, *Compagnie Internationale d'Assurance et de Réassurance*, a MAPFRE subsidiary. Europe was his area of operation. In 1998, after MAPFRE's four reinsurance subsidiaries had been combined into a single company, MAPFRE RE, Compañía de Reaseguros, he was appointed Underwriting Manager for proportional business in "non-EPLA" countries, i.e. countries other than Spain, Portugal and Latin America. In 2002 he was moved to his current area of responsibility: Manager of the AAA (Asia, Africa and Australasia) geographical area.

“MAPFRE RE’s portfolio has not changed”

A career devoted entirely to reinsurance at MAPFRE. This could be a concise way of introducing Jesús Galeote, who started working in the area of reinsurance at MAPFRE 25 years ago. His career has been rich in variety and stories, typical of someone fully involved in his work as the Manager responsible for AAA, which comprises the geographical areas of Asia, Africa and Australasia. Knowledge, experience and personal relationships which help promoting the business of MAPFRE RE, one of the world’s top 15 reinsurers.

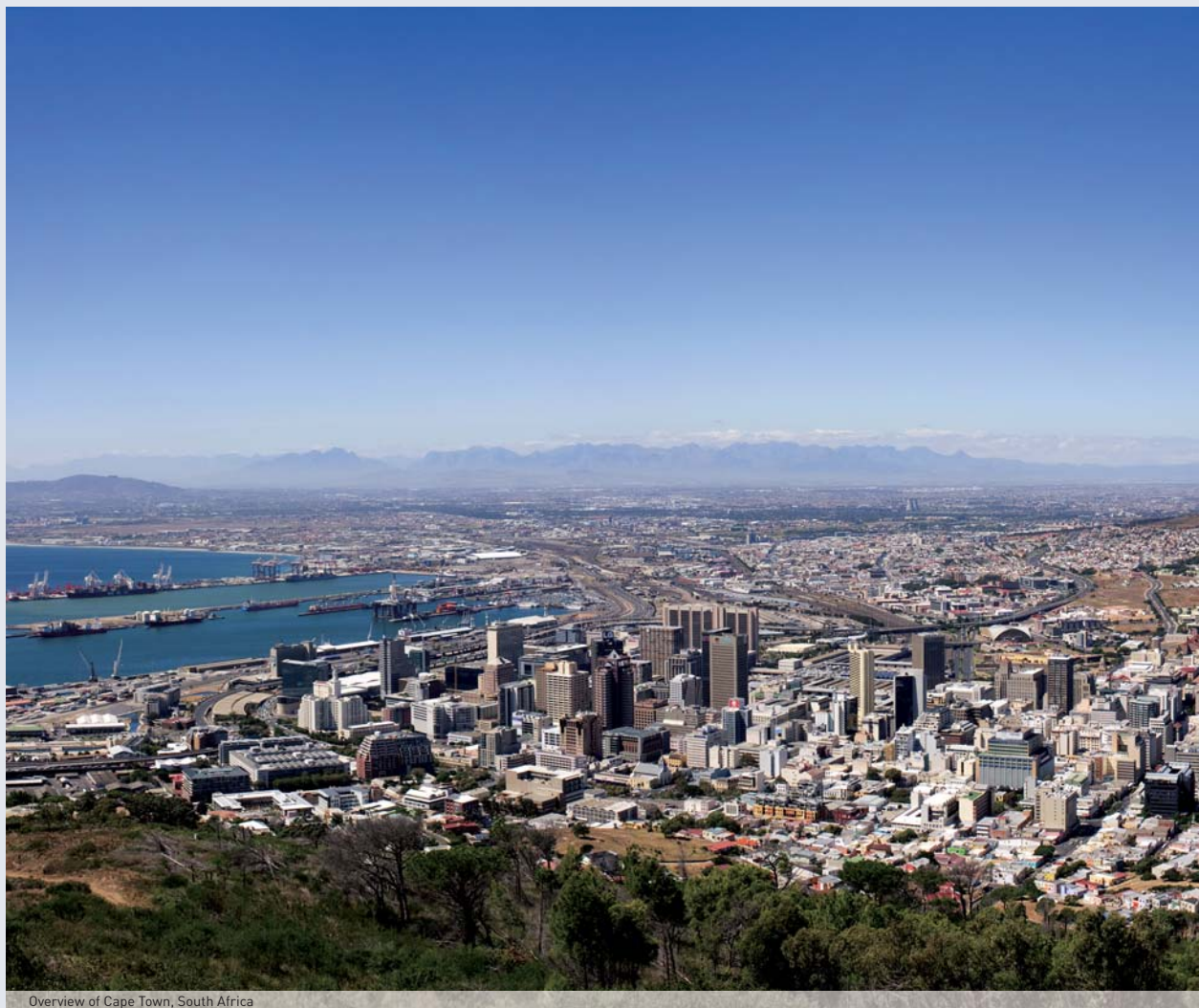
When you first came to MAPFRE, were there any concerns about reinsurance?

I joined in 1985, when MAPFRE Servicios de Reaseguro had already been created. There were very few of us at that time and the reinsurance we did was very basic, with some of it being arranged over the phone. We did facultative reinsurance practically only in Spain and were starting to get involved for the first time on contracts from Europe and Latin America. This was a time when in Spain even household policies were being reinsured. The people who created MAPFRE Servicios de Reaseguro came from direct business, where they had a lot of experience. They only did business in the areas they were familiar with. For many years, everything was focused on Non-Life business; we only started with Life business a relatively short time ago.



Manila, Philippines

Twenty five years ago, reinsurance was based on personal relationships



Overview of Cape Town, South Africa

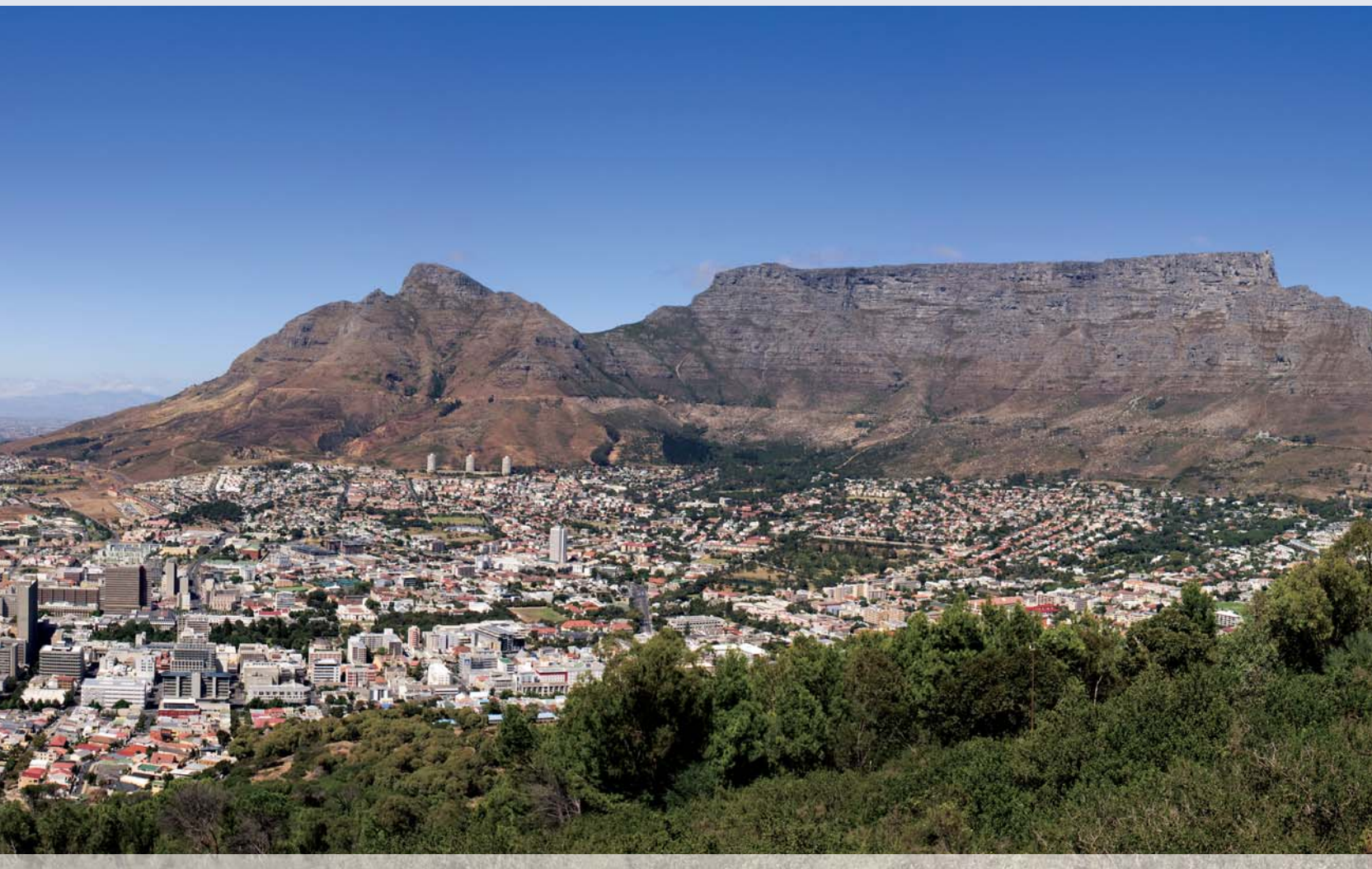
You started off as a facultative underwriter and then moved into non-proportional reinsurance until 1992. How did that experience influence your knowledge of insurance techniques and your subsequent professional activities?

My best asset was being able to speak English. Right from the outset I was involved in business relating to non-Spanish-speaking countries. My first business trip was to Germany, where I spent one period of training at *Bayerische Rück* and another with the broking firm of *Jauch & Hübener*. We stepped up business with Europe by working with reinsurance brokers from London, Copenhagen and Paris. Speaking English was essential. We then started to work in the USA through the Paris correspondents of US brokers.

MAPFRE already had a calling towards Latin America. What were they doing as regards reinsurance?

I was not directly involved because I was assigned to non-Spanish-speaking markets. But MAPFRE RE did indeed begin to open up markets in Latin America, partly because we had a shared language and history. At that time, not many people were interested in reinsurance in that part of the world. My involvement did not last very long. It was the period in which the reinsurance monopoly in Argentina ended. MAPFRE RE had an office there and decided to boost its portfolio. But we had to start practically from scratch with motor programmes. When MAPFRE XL was set up in 1987, we stopped no longer were a department within MAPFRE but an independent company with other responsibilities.

Between 1992 and 1994 you were on the other side of the table, working for the Outwards Retrocessions Department. The people you



were talking to then were reinsurance brokers and other reinsurers. What were the challenges of that period?

The view changes, depending on whether you are a reinsurer or a cedant, because the individual objectives are different. But certainly, you do have a different point of view. This was very useful to me for dealing with other reinsurers and brokers. It was also a bad time, just after hurricane Andrew, the biggest loss that MAPFRE RE had had to deal with up to that point.

Did the international market give credibility to MAPFRE as a reinsurer?

Twenty-five years ago, reinsurance was based on personal relationships, starting with those established by the then Chairman of MAPFRE, Ignacio Hernando de Larramendi, and other important Directors such as José Manuel Martínez, the current Chairman, or Andrés Jimé-

nez, the current Deputy Chairman, amongst others. Business was produced above all through the trust generated by the MAPFRE name. The company did not have that much capital, nor did it have extensive experience. It is true that MAPFRE RE was the only international Spanish reinsurer and could be considered rather exotic. But new goals were sought and in 1989 the company opened an office in London to serve the market.

Any personal anecdote?

When I went to Brussels they asked me to look after France and I did not even speak French, which then I learnt in Brussels. That is why, initially, I didn't achieve great results on my visits to France. Later, once I had mastered the language, I did. I visited many companies and also the small mutuels. We never tried to exceed our capabilities and it worked well for us.

If it has sometimes been necessary to be flexible, this has been done with technical support



Shanghai, China

How would you sum up your stint in Brussels?

When I arrived there, MAPFRE RE already held 51 per cent of CIAR, *Compagnie Internationale d'Assurance et de Réassurance*. The plan was that CIAR would become the branch office for certain markets in Europe. It had to undergo changes because, although its underwriting standards were similar, it was a different company and did business in a way that was not necessarily the same as that at MAPFRE RE. CIAR is still in existence today, because it was involved in direct business, but is no longer active. Things were not so easy at the outset but that has totally changed.

MAPFRE RE had the idea of promoting business with local reinsurers. In those years we relied on *Caja Reaseguradora de Chile*, *Reaseguradora Hemisférica* in Colombia, CIAR in Belgium and MAPFRE RE in Madrid. That was when the rating requirements began. MAPFRE RE decided that instead of having four small rein-

surers it could be one large one. My job in Brussels was to transfer what CIAR was for Europe to MAPFRE RE. When we went to negotiate on behalf of CIAR, we had to mention that we were part of the MAPFRE Group, because CIAR's capital was reduced. Companies like Ecclesiastical, Vaudoise, Cattolica and Shelter had a stake in CIAR. All of them were invited to participate in MAPFRE RE's capital and they accepted. This process of concentration took place in 1998.

Was that what turned you into one of the world's top 50 reinsurers at the time?

That and the real change that occurred. Operations in such distant markets (at that time) as Japan and Australia were intensified. With the capital we had and the new ratings, we became a reinsurer to be reckoned with.

Besides Europe and Latin America, when did the company start to work with the USA?



The company started to do business with the USA primarily from 1987, when MAPFRE XL was set up. The business was written from Madrid and mainly through European brokers. Later, the New Jersey office was opened and we acquired Chatham, a reinsurer belonging to the Ecclesiastical Group. They had a licence to operate in every state, which made it more interesting, and that is how MAPFRE Reinsurance Corporation (MRC) -which was MAPFRE RE in the USA- came into being. Although it was a local reinsurer, its capital was not as high as MAPFRE RE's, which is why it was subsequently decided to have a single entity and operate as MAPFRE RE with a Trust Fund for the USA.

The commercial side of things is considerably influenced by relationships...

It has been hard work, by which I mean to say that penetrating the European market has taken time. But it helped me learn the com-

mercial side of things. You have to have some idea of what it will take to get the business and of the actual client as a business unit. We are quite strict. If it has sometimes been necessary to be flexible, this has been done with technical support.

When you came back from Belgium your geographical area of responsibility was very big. How did you ensure the continuity of the work done by your predecessors at MAPFRE RE in such far-off markets as Japan, the Philippines and Southeast Asia? What do you think of the opportunity of starting to do business in the Chinese market?

We started operating in the Middle East and Asia in the late 1980s. The Manila office was in fact set up in 1987. When I took charge of this geographical area, MAPFRE RE was much bigger and had far greater possibilities than it had had at the outset. It was a MAPFRE with a good capital base and a satisfactory rating. I had gone to Japan, accompanied by my predecessors, who had been visiting that market for years. I learnt a lot from them. When I started to travel on my own, I was representing a serious reinsurer with higher solvency levels, which allowed us to take on shares that were more in line with our capacity. Markets opened up and it is true that our rating was a big help. MAPFRE RE currently has an AA rating from Standard & Poor's and an A+ rating from AM Best, and has managed to keep these for the last seven or eight years. Despite the September 11 attacks and what that meant for the economy, MAPFRE RE's portfolio has not changed.

But does Spanish insurance and reinsurance have a good image in markets like Japan, the Philippines and China?

As far as MAPFRE RE is concerned, yes, but the Spanish market is also of interest to them, particularly institutions like the Consorcio de Compensación de Seguros (Insurance Compensation Consortium) and Agroseguro (Spanish agricultural insurance pool).

China is a market with major natural hazards. Earthquakes, climate disasters and typhoons occur quite frequently.

The earthquakes that have happened in China have not yet been a major problem for reinsurance. Mass risks do not include earthquake

Penetrating the European market has taken time

In times of crisis like the current one, reinsurance represents a source of additional capital and tends to be used more



cover, and the level of insurance penetration is not that high. When people buy insurance, they go for the most basic cover, but this does not include earthquake cover, because it is very expensive. The last heavy snowfall did, however, prove more costly because it affected companies and Transmission and Distribution lines (T&D lines).

In relation to insurance overall, the share of reinsurance is falling. It used to account for 10% of insurance business but this share has fallen to approximately 5% in recent years. Is this trend going to continue?

Well, it is likely to, but that does not mean that

reinsurance will disappear, because there will always be new companies being set up. There are still a lot of markets left. In times of crisis like the current one, reinsurance represents a source of additional capital and tends to be used more.

With the different time zones, how are work operations implemented at MAPFRE RE's representative offices?

In our area we have offices in Manila, Peking and Athens. I am mainly in touch with the offices early in the morning. Most of my colleagues, who take care of Latin America, are in contact in the afternoon.



Your move to Brussels basically coincided with Spain's incorporation into the EU and European integration. What did this mean for you?

It was a very enriching period. Professionally, it did me a lot of good. It allowed me to better know the European markets, something which could have been done from Madrid, but on paper. I got a lot out of visiting the markets and also from taking part in big meetings: the Rendez-Vous de Monte Carlo, Baden-Baden, etc. It allowed me to become involved in commercial management. Up until then, due to my training, I had always been a technician or underwriter. What I liked was analysing the business and managing the figures. I was never very directly involved in the commercial side of things, except when I moved to the retrocession department, which had to deal with reinsurers and brokers.

Is there anything that attracts you professionally? What would you like to investigate?

You are always learning. I always say that I was lucky when I joined MAPFRE RE and was able to be involved in the creation of MAPFRE XL, when there were only four or five of us, and how much this contributed to today's MAPFRE RE. I went through every area: facultative, XL reinsurance, ceded reinsurance, proportional, markets, and now other markets. I was on the technical side as Technical Manager of all the non-commercial side and I am privileged to have gained a global view of what reinsurance entails. What would I like to do? Any new challenge would interest me immediately.

agenda

COURSES ORGANISED BY ITSEMAP STM (MAPFRE SERVICIOS TECNOLÓGICOS, S.L.)

Risk Management and Insurance Expert Cycle	Method	Date	Venue
Seminar 1 Risk identification and assessment, estimation of losses and appraisal of assets.	Attend in person	First half of 2011	Madrid
Seminar 2 Integral safety, reduction and control.			
Seminar 3 Financing of risks: insurance programmes (I).			
Seminar 4 Financing of risks: insurance programmes (II) and ART.			
Seminar 5 Design and implementation of a risk management programme.			

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