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THE VALUE OF RISK

Swiss Re and the History of Reinsurance



HAROLD JAMES, PETER BORSCHIED,
DAVID GUGERLI, & TOBIAS STRAUMANN

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*Swiss Re and the History
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PART II

COOPERATION AND
COMPETITION:
ORGANIZATION AND
RISKS IN THE
REINSURANCE
BUSINESS 1860-2010

DAVID GUGERLI

CHAPTER 6

INTRODUCTION

MONTE Carlo, 11 September 1968: for more than a decade, the '*Rendez-Vous de Septembre*' had offered representatives of the reinsurance industry a platform where they could examine the status of their contracts, discuss how the industry was doing, and explore what further possibilities the business offered. After a summer of political upheaval and social change, Monte Carlo made a stark contrast, the late summer Mediterranean sun glistening through the windows of the Palais des Congrès.

The May protests in Paris, the Zurich *Globus* riot and the burning of department stores in Frankfurt were now in the past, and international terrorism and September 11 were yet to become relevant to insurance. What did stand out was that on this Wednesday morning, in the middle of a raging economic boom and in the elegant surroundings of the Palais des Congrès, there was explicit talk of the 'crisis', meaning an international crisis in the reinsurance industry.

Fortunately, the programme had announced that one of the industry's *éminences grises* would be taking part in the event. Per M. Hansson was the strong man of the Scandinavian insurance industry and fully acquainted with the problems of the international business. He would be sure to give a balanced assessment. Hanson, a clever strategist with a *long* horizon, had been internationalizing the Storebrand Insurance Co. Ltd since the 1940s, turning it into an important reinsurer in Latin America. Were Hansson to say that the reinsurance industry was in bad shape, it would be coming from a trustworthy authority.¹

¹ SRCA 10.150 708.05, Monte Carlo Rendez-Vous de Septembre 1968, Programme, 26 July 1968. Hansson was preceded by Julius Neave, The Mercantile and General Reinsurance Company, on the role of the professional reinsurer in the modern world. See Neave 1980. Later that afternoon, M. O. Vossen, chairman of the German Property Insurer's Association (Verband der Sachversicherer) and Director General of Kölnische Versicherungs-AG gave a presentation in which he reported on the fire insurance market in Germany.

1 THE CRISIS

The audience must have been stunned by Hansson's remarks and arguments. There was no formulaic message pitched somewhere in the neutral range between guarded optimism and restrained pessimism. Instead they were presented with quite a blunt analysis of the problems facing the reinsurance industry. The time when it was possible to rely on the experiences of the past was well and truly over, Hansson said. The reinsurance industry had never been a stranger to problems, so this was no reason to panic. But what the industry was going through now was a veritable crisis. 'I think we are justified in describing the present situation in such a strong way, and I will try to explain why I am of this opinion.'² Hansson made reference to the strong, continuous economic growth that had followed the Second World War, producing unprecedented results, particularly in the field of scientific and technical development. New products and manufacturing processes, the higher concentration of assets, and the globalization of the businesses of both policyholders and insurers continued, along with the growing importance of electronics and new communication tools. But the size and complexity of risks was growing. Larger and more expensive buildings, structures such as factories, ships, and aircraft, were all creating new risks for which there were no tried-and-tested assessment methods—'all of which has contributed to the catastrophic results in the insurance industry.'³ The disparity between sales and earnings, the negative underwriting results despite strong economic growth, the tendency of direct insurers to offer their own reinsurance, the increase in the number of risky contracts, the blind faith in direct insurers' risk assessments, and many other factors gave rise to doubts about the necessity of reinsurance in principle or even led to the idea of nationalizing it.⁴

The fact that Hansson ran a company that operated both as a direct insurer and a reinsurer gave even greater credence to his analysis. Both branches of the industry were confronted by the structural changes in industrial, growth-driven economies, albeit in different ways. This could be seen from the new forms of risk arising. Direct insurers could choose to avoid branches of the insurance business altogether, leaving them to newer, more adventurous companies. Or they could treat the new forms of risk like established risks, that is, by issuing a normal fire policy for mainframe computers. They would then try to pass all the complicated risks to reinsurers in line with the maxim that reinsurance was nothing other than the triumph of hope over reason. At the same time, large insurance companies were increasingly in a position to distribute such risks within their own companies once they had carefully been assessed. In contrast, small and new insurers, with their somewhat riskier business models, continued to cling to the reinsurance companies. The market niche between the direct insurer and the state as 'insurer of last resort' became ever narrower and riskier.

Furthermore, the trend towards short-term optimization was particularly devastating for reinsurers, who were only able to achieve profitable results through long-term

² Hansson, 'The International Reinsurance Crisis', *The Review*, 4 October 1968, 1140.

³ Hansson 1968, 1140. ⁴ Hansson 1968, 1140.

contracts. To insure major risks with a low probability of occurrence, it had to be possible to distribute them over longer periods of time. The intense competition from many businesses new to the market had the consequence of producing growth, but this growth was short-term and with lower profits. It was unclear who would remain after this sprint and which companies would exhaust their resources to the extent that they dropped out of the race altogether. The increasing concentration of assets and the globalization of operating activities by policyholders should actually have increased the insurance companies' reliance on the international expertise and the technical advice of the reinsurers. On sober reflection, however, this was not the case. The falling profits of the reinsurers were only glossed over by the massive increase in order volumes and by high interest rates and the success of the investment business.

Hansson talked about developments that were bound to end in catastrophe sooner or later. Risk distribution specialists around the world were operating an extremely risky business and deceiving themselves with false facts. 'The seriousness of the situation for the whole insurance industry becomes evident when comparing the growing need for reinsurance with the reduced reinsurance capacity,' commented Hansson. 'I think, therefore, that if we want to keep the insurance industry in private hands, the existence of reinsurance institutions is essential.'⁵ This was both rhetorical technique and a fundamental diagnosis. There was only one way to answer the question of whether the reinsurance industry should be kept in private hands or not for this audience. It was obvious to both Hansson and his listeners that national governments would not be able to solve the reinsurance problem. It would have made it virtually impossible to distribute risk globally leading to the end of the reinsurance industry. Hansson, however, was clear in his rhetorical warning about what was needed to prevent the industry from disappearing altogether: the call for specialized institutions for the reinsurance industry. This appeal needed to be justified in greater depth and to do so, a more detailed explanation was necessary.

2 THE RISKS

This much was certain: the reinsurance industry was faced with the phenomenon that several development trends, all with different causes, were negatively impacting the business. Hansson wasn't the only one on high alert. The previous speaker, Julius Neave—a kind of impresario of the international reinsurance industry and one of the leading figures in the London insurance market—took the same line: 'Reinsurance has entered a period of change and transition'. We need to face up to the challenges of our time. Anything else would be 'fatal to our profession.'⁶ Both speakers suggested that the reinsurance industry could no longer keep up with technical, scientific, economic, and social changes because these changes meant that there was no reliable empirical data for the future evaluations. 'One of the obvious basic problems of underwriting is that rating

⁵ Hansson 1968, 1141.

⁶ Neave 1980, 3.

must so often be determined without the benefit of previous experience,⁷ said Neave. Hansson added that it simply wasn't good enough to evaluate and accept offers 'by taking into account only known and incurred but not reported losses. One must also calculate with all the other factors which can influence the future development of the risk. This one must do, even if the facts cannot be drawn from fresh statistics.'⁸ To project the potential claims for the next ten years, it was not anywhere near sufficient to simply plot the largest disasters of the last hundred years.

Put plainly, a present-day assessment of the future was being made on fixed, past experience. Neave warned that one only had to think of the Contergan scandal to see that the speed of scientific and technical change had made the financial implications of an insurance contract unpredictable. Indeed one's own ignorance could lead to risks that extend far beyond what was assumed. In the liability insurance segment, it was even the case that inflation—'this unpredictable, uncertain, and capricious factor'—had distorted the results so that the premium calculation in the 'long-tail non-proportional reinsurance' segment was now just based on educated guesses.⁹

That the reinsurance business was experiencing a structural crisis and that the tried-and-tested business models had run their course had now been openly argued and justified on this morning in the Palais des Congrès. For Hansson it was clear that the only way the crisis could be overcome was to improve the information available to reinsurers. And this improvement would only be possible if there were more coordination and cooperation. However, this would be difficult because the assumption was that reinsurance relied on an open market. It would somehow be contradictory to coordinate the reinsurance industry. 'Tariff cooperation and cartels belong to the order of the day for companies writing direct business', that is, for the uniform retail business of direct insurers. Still, this principle would need to be scrutinized: 'in view of the difficulties facing the whole reinsurance industry, it would be useful to seek realistic, effective forms of contact and co-operation.'¹⁰

Hansson's arguments also addressed how the reinsurance industry organized itself. The term 'cartel'—a loaded word for reinsurers, who rely on the highest possible level of flexibility for their services—was even then only ever permitted in the context of the direct insurance companies. Hansson, however, used the phrase 'effective forms of contact and cooperation' as a diplomatically acceptable description for how the reinsurance industry needed to organize itself. If the liberal and competition-oriented reinsurance companies felt that their flexibility was so threatened that they openly flirted with the idea of establishing industry-wide cooperation with better coordination, this was clearly a symptom of crisis. It also meant, however, that the question of industry-wide organization would be particularly relevant once the risk situation changed. The answer to this question would not be the same before the crisis as it would be after.

⁷ Neave 1980, 4.

⁹ Neave 1980, 7.

⁸ Hansson 1968, 1141.

¹⁰ Hansson 1968, 1141.

3 THE ORGANIZATION

This insight can be used to trace the history of the reinsurance industry. How insurance deals with risk situations has had to be continuously revised over the course of the last 150 years. The story of the reinsurance industry can be told as the relationship between organization and the risks of the reinsurance company. This time, in Monte Carlo, everyone thought that things were different—that the problems were brand new unlike the 'normal' difficulties of the past. However, when we look at the history of reinsurance, it will become evident that changing risk situations and organization have always been issues in the reinsurance industry. Tracing these problems will allow for greater insight into the development of the industry since the middle of the nineteenth century. Which forms of risk and risk distribution encouraged cooperation, and which ones needed no organization? How did an industry that had always been sceptical about cooperation between companies manage to organize itself? How did structures for coordination and cooperation emerge in an industry where contract partners usually construed them as unfair practice? Which changes in the direct insurance market caused what changes in the reinsurance industry? What alternative instruments could reinsurers develop to open communication?

The changes in risk situations and the organization of the reinsurance industry can best be revealed by breaking down the long history of the modern reinsurance industry into three periods of different length.

In the first period that began with a boom in new companies in the 1860s and lasted until the 1950s, the organization of the reinsurance industry developed under the domain of the direct insurance industry. Initially this happened with more sporadic, usually ineffective forms of high-level interaction between reinsurance representatives. These usually had no effect on businesses or organizational forms. Industry-wide coordination and cooperation between companies only became apparent with the earthquake in San Francisco (1906) under the rigours of early globalization.¹¹ In the follow-up to overcoming this and other major catastrophes, more cooperation became necessary, particularly to monitor the direct insurance companies. The challenging conditions for global financial service providers during the interwar period when stringent currency provisions massively restricted the free flow of capital also required the industry to become networked through complex investment and holding structures.¹² However, new instruments used in normal everyday business could also be seen as a motivation for reinsurance companies to cooperate. This included the not always popular but often unavoidable practice of retrocession, which involved transferring parts of a reinsurance contract to one or more competitors to reduce and distribute the risk.¹³ It was essential to partially clarify the conditions under which a risk was calculated. Finally, the growing

¹¹ Röder 2008.

¹² Windolf 2002.

¹³ Much the same could be said about the principle of reciprocity, see Reid 1963.

number of excess-of-loss contracts also represented a problem that affected the entire industry. They had been in use for a number of decades but did not catch on until the 1930s in the heavily regulated motorized vehicle insurance and aviation industry markets. They were particularly problematic for reinsurance companies because they caused a considerable shift to very rare but very large claims that had to be paid by the reinsurers. Coordinating activities and carefully monitoring the competition helped in using this instrument more effectively. It is therefore no surprise that during the interwar period, various meetings of representatives of individual insurance industries were organized in Baden-Baden, and most importantly, the first annual meeting of reinsurers in Monte Carlo in 1957. These meetings were intended to encourage participants to share their experiences.

The second development phase for the organization of the reinsurance industry was the structural crisis of the 1960s described by Hansson. Efforts were made in the 1970s to overcome this crisis. Important factors were the growing need for coverage with declining returns, the structural transformation of Western industrial and growth-driven economies with their new forms of risk, and the disparity between the interests of the direct insurers and the concerns of reinsurers. Additionally, the lack of a common, accessible basis for assessing the situation led to the realization that the industry was suffering from 'insufficiencies in brain power and know-how to cope with the new situation' and that the information situation of reinsurers had to be fundamentally improved.¹⁴ This insight did not lead to clear, immediate measures. It led to a diagnostic and strategic diversity in handling the organizational problem. These strategies included discursive self-reassurance, systematic exchange of information, institutionalization of industry-specific research, specific industry publication forums, a massive rise in the academic levels of staff, and more cooperation with university institutions. A new simulation-based realism developed in risk assessment, along with careful plotting of major catastrophes, and cultivation of a global economic insurance environment that made distinctions between world regions and different types of insurance markets.

Finally, the third period began in the 1980s. This period was characterized by accelerated globalization of overall economic conditions and heightened competition within the industry. Particularly under the aegis of the EU's economic policy, the principle of the free movement of capital and services, in addition to the principle of the free movement of goods and people, slowly took hold.¹⁵ Typical for this period was tough competition, leading to strong market concentration among major reinsurance companies after a huge wave of mergers and acquisitions. It was thus unnecessary to intensify cross-industry organization. The companies were not seeking to set up knowledge infrastructures between companies. Instead, they wanted to ensure optimum knowledge circulation and combination within the company so that risks could be sufficiently managed. To this end, specialists were systematically recruited in the areas of finance, business administration, accounting, law, and actuarial theory. During this period, reinsurers also hired more and more engineers and natural scientists who modelled scenarios of future risk fields using

¹⁴ Hansson 1968, 1140.

¹⁵ Werner 2010.

computer-assisted methods. The expectation that the reinsurance industry and the banking sector would converge played an important role. On the one hand, the role of reinsurance as a financial service was discovered and, on the other, financial innovations were used to hedge and distribute major catastrophes and drew more attention to the financial markets for asset management as well. After the financial crisis an attempt was made to align the self-regulation of the industry with the new supranational regulatory efforts and set out on a stable, solvent path to a new core reinsurance business.

Per M. Hansson's proposal back in September 1968 for overcoming the reinsurance crisis went far beyond what was achieved in the following four decades from an organizational standpoint. A 'rating centre for loss excess, catastrophe covers, and so on' was supposed to be set up, a 'joint hull agreement' concluded, an international information centre for reinsurance companies formed, and an annual working conference arranged, among other things.¹⁶ This was a lot. At least more than could be implemented and still less than what actually happened. One only has to think, for example, about the development of risk management or the breakthrough of computer-assisted, actuarial simulation technology. This difference was not a result of analytic or strategic weaknesses in Hansson's explanations but because the pace of development of global economic conditions had become unmanageable. Hansson's description of the crystal-clear picture in the rear-view mirror was also simplistic and his rhetoric geared toward the crisis of his time. But his late summer remarks in Monte Carlo show that the dual question of the right organization and the current risk situations had a productive impact on the history of the reinsurance industry.¹⁷

¹⁶ Hansson 1968, 1142.

¹⁷ I would like to thank Daniela Zetti, Tanja Bräm, Lea Haller, Tobias Straumann, Alexandros Kyrtis, Welf Werner, and Erich Projer for their critical support of this study. I am also grateful to Niels-Viggo Haueter, Fritz Gutbrodt, Anne-Katrin Becker, and Jörg Zimmer who paved the way into the material, the archive, and back to the text for me. Simone Roggenbuck always kept me from drawing the wrong conclusions from a complex situation.

CHAPTER 7

REINSURANCE COMES INTO
ITS OWN 1860-1960

REINSURANCE is a specialized kind of insurance that distributes relatively large and rare risks or entire portfolios of risks. It only emerged as an independent company form in the second half of the nineteenth century and experienced a boom in the age of rapid industrialization or the 'age of capital' (Hobsbawm). This can be shown statistically: after the Kölnische Rückversicherungsgesellschaft (Cologne Re) was founded in 1842, thirty-seven reinsurance companies were formed by the end of the century including fourteen in Germany, five in Austria, and three in Switzerland. Another 119 companies were added by 1925, most of them with headquarters in Scandinavia and the USA.¹ During the early modern era, it was already common in the shipping industry to distribute major risks to several insurance companies or to insure them with other insurance companies using certain kinds of contracts.² However, as an independent organizational structure, reinsurance clearly belongs to the age of industrialization, which presented a whole new set of requirements in terms of handling hazards, uncertainty, and risk.

1 INDUSTRIALIZATION AND GROWTH PROBLEMS IN THE INSURANCE INDUSTRY

The particular insurance-related requirements of the industrial age were very diverse in nature. Industrialization caused upheaval in the familiar price structure and produced

¹ Manes 1931, 289.

² The (German) reinsurance industry traces its roots back to late medieval Genoa and to 12 July 1370. A traditional reference is the Treaty of Genoa by Gerathewohl et al. 1979, 697-9, with references to Sack 1941, 49-50. See Mossner 1959, 28-34.

unexpected disparities in income.³ Demand for insurance services increased drastically. Insurance companies increasingly operated a retail business but, at the same time, they had to learn how to deal with the growing concentration of assets in factories, with the new potential dangers posed by mechanized production processes, and with the changes in transport brought about by steamships and railroads. The insurance market also changed because of the many social developments linked to the creation of an industrial, growth-driven economy: the accelerated pace of urbanization, the spread of middle-class lifestyles, legal protection of ownership structures, the introduction of a liability law, and the birth of the welfare state. All these factors and others meant that the needs and the possibilities for insurance changed and confirm how reinsurance arose as a result of changes in the insurance market during the age of industrialization.⁴

Industrialization gave the insurance market momentum by creating new risks and producing more demand for insurance services. This is demonstrated by the growth in the number of companies operating in the market: around 1800 there were just thirty insurance companies operating in eight countries, by 1850 there were already 306 companies in fourteen countries, and by 1900 an impressive 1,272 insurance companies were doing business in twenty-six countries.⁵ But it is unclear why the insurance industry did not push growth in its markets simply by forming more insurance companies in the second third of the nineteenth century. Could they not have just divvied up the strong demand for insurance services amongst themselves and jointly hedged the contractually covered risks? Why had the growth rate led to a structural problem in the insurance industry? Why were direct insurers also convinced that they could overcome the limits to their own growth in the long run by founding specialist reinsurers, especially as this institutional innovation deprived them of a considerable portion of the total premium volume?

The answer lies with the qualitative changes in demand for insurance services, which in turn changed how the insurance industry had to be organized. Industrialization did not only create a larger market, it also created a more complex risk environment for three reasons.⁶

First, the insured objects were becoming increasingly diverse. In terms of fire insurance, for example, this meant that massive structures, infrastructure systems, and factories needed to be insured in addition to wooden and timber-framed houses. As the insured objects became more diverse, so it became much more difficult to determine the potential damage and appropriate premium rates. Entrepreneurial risk and capital cover

³ Hobsbawm, E. J. (1980), *The Age of Capital: 1848-1875*. London: Abacus, 1975; Landes, D. S. (1969), *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present*. Cambridge, New York: Press Syndicate of the University of Cambridge; Wehler, H. U. (1995), *Von der 'Deutschen Doppelrevolution' bis zum Beginn des Ersten Weltkrieges 1849-1914*, Munich: C. H. Beck; Osterhammel 2009.

⁴ For more on urbanization, see Lees, A. and Lees, L. H. (2007), *Cities and the Making of Modern Europe, 1750-1914*, Cambridge: Cambridge University Press. For more on the liability law and the welfare state, see Ewald 1993; for more on the relevance of a bourgeois lifestyle and planning for insurance, see Daston 1987.

⁵ Swiss Re, *sigma* 11/12, 1975, 2. For more on the number of insurance companies operating in Europe and in the USA, their premium earnings and claim payments starting in 1890, broken down by class of insurance branch, see Manes 1930, 85-9.

⁶ For more on the following argument, see Hollitscher 1931, 27-9.

rose dramatically. Transport insurance too saw demand grow for insurance for increasingly varied means of transport with different engines, designs, routes, loads, and crews. Only life insurance was relatively clear-cut. Death rates still generally corresponded to the life insurance mortality tables. For life insurance it was the growing range of medical diagnoses that mainly increased the heterogeneity of the 'insured object'.

Secondly, the problem of accumulation increased as the insurance market grew, that is, the risk that an insurer had assumed several liabilities for one and the same risk, at the same time. The greater the tonnage of an ocean cargo ship, the more likely it was for several shipments to be registered with the same transport insurer. The more concentrated urban populations became, the more likely it was that a fire insurer would have to respond to a number of claims at the same time in the event of a major fire. Natural hazards are particularly conducive to accumulation—as hail storms had proved time and time again. Sufficient homogeneous distribution of the risks was not possible with direct insurance alone.

Thirdly, beyond the effects of increased diversity of risks, industrialization caused insurance companies to re-evaluate how risks were weighted. The concentration of value that an ocean steamer, a factory, a tenement, a gasometer, or an entire city represented called into question the 'applicability of the law of large numbers', if fishermen's boats, workshops, and farms also had to be insured. These types of unequal weightings for insured objects fundamentally changed the business of insurance companies.⁷

The solution found to the structural changes in the insurance market was to create separate institutions in the insurance industry, namely specialized reinsurance companies. This strategy was pursued until the twentieth century when things changed. Consequently, it makes sense to interpret the boom in the new reinsurance companies in the second half of the nineteenth century as driven by the changing needs of direct insurance companies. Or to put it another way: the insurance industry solved its growth problems in part by creating reinsurance companies. The only place that the conventional co-insurance system, that is, where direct insurers have a stake in one and the same risk, remained intact was on the London insurance market, and until 1864 it even enjoyed a special kind of protection because reinsurance was prohibited.⁸ On the Continent, however, independent reinsurance companies made it possible for direct insurers to outsource one portion of their risks to specialized companies, thus insuring an insurance policy. This contributed to overcoming bottlenecks on the national capital markets in continental Europe.

The cost of forming a reinsurance company was relatively low compared to a strategy of further increasing the number and premium volume of direct insurers. Unlike direct insurers who run a retail business, reinsurers do not need a complex network of agents to sell their insurance policies. Their administrative and personnel expenditures are much lower than those of direct insurers. As it became increasingly necessary to distribute risks, co-insurance could not compete with reinsurance as a conventional alternative because co-insurers usually kept risks in one and the same industry, meaning that risks were inadequately distributed. In contrast to direct insurers, reinsurance companies were able to solve the problems of heterogeneity, accumulation, and concentration by basing their calculations on longer

⁷ Hollitscher 1931, 29.

⁸ See Pearson 2012.

timeframes. They also homogenized the various portfolios of the direct insurers by reshuffling and bundling the risks of different kinds of insurance in different markets or regions.

Apart from these general considerations that encouraged the formation of reinsurance companies, every reinsurance company had its own motives and its own individual context for starting a new company. These also depended on which local conditions and partners either contributed to or hindered their formation. It is said, for example, that Cologne Re was founded as a result of a devastating fire in the city of Hamburg while the Schweizerische Rückversicherungsgesellschaft (Swiss Re) is generally thought to have been formed as a consequence of the major fire in Glarus.⁹

In both cases, it would be inaccurate to claim that there was a single motive. The big fire in Hamburg raged in May 1842 but Cologne Re only issued the first reinsurance contract in 1852. This timeframe is simply too long to establish a causal link between the Hamburg fire as the 'motive' and the formation of the Cologne Re as the 'reaction'. Indeed, the idea to set up a reinsurance company in Cologne had been mooted before 1842.¹⁰ In the case of Swiss Re, even though the chronological coincidence is striking, the causality is not conclusive. Just two years passed between the fire in Glarus in May 1861 and the formation of Swiss Re in December 1863. Still, the catastrophe in Glarus appears to have had some impact leading not to the formation of Swiss Re, but to the creation of the Schweizerische Feuerversicherungsgesellschaft Helvetia (Swiss Fire Insurance Company) in St. Gallen.¹¹

In truth, the Hamburg and Glarus catastrophes were events that revealed, in insurance terms, the massive growth in business volume. It also made it plain to the fire insurance companies precisely which risk concentration they were now exposed to in this age of rapid urbanization. Where structural changes were planned in the insurance industry, the fires in Hamburg and Glarus could be used as justification because they were likely to be appreciated and accepted. The economic argument of the role and benefits of reinsurance, on the other hand, was much more difficult to convey. 'Glarus' and 'Hamburg' were reliable: they remained, like other catastrophes, firmly engrained in the collective memory as points of reference extending far beyond the group of people directly affected and far beyond the problems they created for insurance. However, they did not have a predictable, or even compelling impact on the potential scope of activities in the emerging reinsurance industry.

2 REINSURERS' INDEPENDENCE AND ATTEMPTS AT ARTICULATION

In July 1863, when the director of Helvetia presented his business plan to establish a reinsurance company and had to justify to future investors why this kind of company was required, it certainly was not enough to cite the example of Glarus. Moritz Ignaz

⁹ For an example of fires as a reason for the formation of reinsurance companies, see Koch 1969, 161–3. For an example of a catastrophic fire appearing in a company self-portrait, see Swiss Re 1989, 2.

¹⁰ See Kölnische Rückversicherungsgesellschaft 1953, 30–1.

¹¹ Gerathewohl et al. 1979, 742.

Grossmann had to go into more detail about the advantages of an independent company. He began by explaining the disadvantages arising from co-insurance, practised when managing large risks that exceeded the insurance capacity of a direct insurance company. He also felt that the old method of passing on risks in the form of so-called obligatory reinsurance was dangerous for the counter-party as the risks involved were not transparent and might be of the same nature as their own. This could accumulate the losses for the reinsuring party. Under the terms of these contracts, a company was obligated to accept reinsurance contracts passed on to it by others within certain limits and under certain conditions. These kinds of reinsurance contracts between insurers were only viable if the companies 'worked in different fields or exploited different risk categories'. But even this required 'absolute trust' in the 'business capability and loyalty' of the ceding company.¹²

An insurance company could only exchange risks with another insurance company if it was familiar with the other company and its business, that is, that it was a direct competitor. Grossman became almost polemic at this point: 'How is a company supposed to commit upfront to assuming reinsurance from a competitor for risks that they themselves are either directly involved in or that could overlap with other insurance policies they have taken on? It would create difficulties for itself while simultaneously helping out a competitor, thus creating a double disadvantage.'¹³ It was no surprise, therefore, that most insurers tried to solve their reinsurance problems with their own trusted subsidiary.¹⁴ If, however, every insurance company pursued this strategy, their own subsidiaries were not in a position to sign reinsurance contracts with other insurance companies because all of them were reinsured by their own branch offices. This made it extremely difficult for a non-autonomous reinsurance company to bundle different risk types. In effect, they all originated from the parent company and had their own company-specific risk pattern.

Grossman's conclusion was radical: the only way to make progress was to form independent reinsurance companies. This type of company would facilitate a business that could be expanded 'more carefully, more thoroughly, and more successfully' than a 'direct institution that only did reinsurance on the side'. Moreover, this model had more appeal because the companies could expose details of their businesses to an independent reinsurer as long as the reinsurer 'itself did not conclude any direct insurance policies'.¹⁵ The third advantage, in addition to potential insurance specialization and protection against

¹² SRCA 10.101 501.03, 'Gutachten zu Handen der Tit. Schweizerischen Creditanstalt in Zürich über eine von derselben, unter Mitwirkung der Allgemeinen Versicherungsgesellschaft Helvetia in St. Gallen zu gründende Rückversicherungsgesellschaft' 2-3, I. M. Grossmann, July 1863, St Gallen (transcript), translated quotes. (Report for the attention of Schweizerische Creditanstalt in Zurich concerning the establishment of a reinsurance company by same in collaboration with Helvetia Insurance Company of St Gallen, hereafter Grossmann 1863.)

¹³ Grossmann 1863, 2.

¹⁴ For more on forming reinsurance companies as subsidiaries, see Gerathewohl et al. 1979, 738-40 and Arps 1965, 209-10.

¹⁵ Grossmann 1863, 2.

disclosure of business and company details to direct insurers, was the prospect of internationalizing the reinsurance business.

While other fire insurance companies had formed their own reinsurance companies—the Aachen-Münchener Feuerversicherungsgesellschaft had established the Aachener Rückversicherungsgesellschaft in 1853, the Niederrheinische Güterassecuranzgesellschaft had set up the Weseler-Rückversicherungsverein in 1840, Deutsche Phönix had created the Frankfurter Rückversicherungsgesellschaft in 1857¹⁶—both Cologne Re and Swiss Re were explicitly not conceived as subsidiaries but as autonomous companies. They were to be largely independent of insurance companies and run their operations with the considerable involvement of banks. When Cologne Re was established in the period from 1842 to 1852, the investors included not only insurance companies in the Rhine region but also French bankers; in addition to the Helvetia in St. Gallen, other investors who participated in the formation of Swiss Re in 1863 were the Schweizerische Kreditanstalt (Credit Suisse) in Zurich and the Handelsbank in Basel. The idea was for the two companies to deal with the structural growth problems of the insurance industry without intensifying the already existing effects of risk concentration and risk accumulation. At the same time, however, they were also supposed to be able to operate without company-specific insider knowledge. The goal was to create a strong firewall between insurance companies and reinsurance companies at both the institutional and industry level.

Even though an impressive number of new independent reinsurance companies were founded in the last thirty years of the nineteenth century, there were few indications that a separate reinsurance sector was taking shape, or at least one able to express the common interests of the reinsurers. In the first two to three decades after its emergence, reinsurance was an organizational specialization in the insurance industry that managed to expand its potential scope of business with help from banks. As an institutionally separate organizational form within the insurance industry, it mainly had to deal with direct insurance companies and initially had no reason to develop its own communication structures or form a separate reinsurance domain or, indeed, an entire industry. Reinsurers didn't have much to say to one another. They were happy when they successfully negotiated with their investors and customers and concluded amicable agreements. This was demonstrated by a meeting of representatives of reinsurance companies from Germany, Switzerland, France, Belgium, and Austria-Hungary in Munich in 1868; they found that even though they shared and discussed common interests, they had little to do with the direct insurers.

The minutes of the Munich Conference clearly show this communication problem. Only at first sight it seems paradoxical that the first stand-alone communication platform for the independent reinsurers initially emphasized cooperation with the customer and their shared interests with direct insurers. 'All those present, inspired by a spirit of conciliation, sincerely hope that the interests of the insurer and the reinsurer always stay

¹⁶ See Gerathewohl et al. 1979, 738-9. The Weseler-Rückversicherungsverein was set up as an internal reinsurance association of the Niederrheinische Güterassecuranzgesellschaft in 1840 and was sanctioned as a stock corporation by the Prussian king in 1843. Gerathewohl et al. 1979, 738.

the same to ensure continuing harmony between them,' reported the minutes of the meeting which appeared in the *Rundschau der Versicherungen* magazine.¹⁷ A hope described as 'sincere' always attracts notice. Were the reinsurers apologizing for meeting without any insurers present? Or was the mention of common interests intended to dampen the firewalls that had emerged when some of the reinsurance companies were created? Because the report on the meeting would appear in a magazine for direct insurance companies—the reinsurers were far from having their own publication—it is likely that the sentence was intended to pacify at least the readers of the *Rundschau*.

In fact, it was good to diffuse the insurers' mistrust of autonomous reinsurers. After all, several members of the conference mentioned 'developing general principles that appear suitable for assuring the prosperity of their company.'¹⁸ Anyone who develops principles is attempting to define the facts and set boundaries between what belongs and what doesn't. Anyone who develops principles is taking things to a political level. It sounds more harmless than it was because the independent financial well-being of the reinsurers was relatively controversial and had not really been a goal of the direct insurers up to that point. Their priority, of course, was the prosperity of the insurance business. Reinsurers did not have the leading role in their own play—many direct insurers were convinced that a tight rein on the reinsurers was required to maintain sufficient flexibility in their own business.

Despite the rhetoric about shared interests, the discussions in Munich led to a clear policy of segregation. They should stabilize the boundary between direct insurers and reinsurers. 'Just as the reinsurers fail at direct insurance and competing with the insurance companies, the latter should also, in upholding the principle of reciprocity, not pursue reinsurance.' Direct insurers are not good reinsurers because they cannot give the 'necessary attention' to such a complex business.¹⁹ This was the reason given for why direct insurers should not transfer risks to other direct insurers—the reinsurers claimed a sole right to the use of the instrument of retrocession, which was often the only means they had to assume and distribute very large risks. If, however, the direct insurance companies engaged in retrocession with each other, the desired segregation of activities would be challenged and the business would potentially become unclear.

The clarification of the business principles and the definition of the boundaries between activities did not end here. The way the reinsurers saw it, 'reciprocity' also meant that the insurance companies, when setting the maximum claim limit they wanted to take on, also had to assume the same maximum put forth to reinsurers. In simple terms, this was a call for increased transparency in setting premiums and assessing the risk. The reinsurers went into attack mode and demanded insight into the unembellished financial figures of the insurance companies. This, however, is exactly what the far-sighted direct insurance companies had wanted to avoid by forming independent reinsurance companies.

¹⁷ *Rundschau der Versicherungen* 1868, 559. See also Arps 1965, 208.

¹⁸ *Rundschau der Versicherungen* 1868, 559.

¹⁹ *Rundschau der Versicherungen* 1868, 560.

Almost immediately after the principle of 'reciprocity' started being used to define responsibilities, it was revised. Even though direct insurers and reinsurers were each supposed to pursue their specialized businesses, direct insurers were also expected to commit to transparent pricing and to never break down the risks and pass part of them on to their competitors. The independent reinsurers who had met in Munich agreed that 'it would be better' to increase the 'hugely insufficient' premiums and distinguish between large and small risks, for example factories should be insured differently from private households. The reinsurers were therefore demanding nothing less than a restriction on competition between direct insurance companies because it led to unrealistically low premiums at the expense of the reinsurers.

At this point in the meeting minutes, with the participants in Munich warming to their theme, they expressed for the first time what they would often repeat with varying degrees of success over the next 150 years: item VII of the Munich meeting minutes, the last one under the debates and discussions, quotes someone as saying 'that the reinsurer generally does not share a destiny with the direct insurer because the latter almost always shows a profit while the reinsurer always shows a loss.'²⁰ Apparently this is where it started getting serious; talk of solidarity and shared interests came to an end. The time had come to make decisions. Under the leadership of Conrad Schaefsberg, director of Cologne Re, the reinsurers passed a resolution designed to create transparent relationships.

They voted unanimously to declare the following to the fire insurance companies: 'as a result of the major losses suffered on storage risk and entrepôts, the unified reinsurers declare that we cannot continue to accept this risk at the current premiums without violating the interests entrusted to us.'²¹ They also wanted the direct insurers to focus more on industry and insure 'the agricultural risk not massively constructed under a hard roof'. Their plan was to withdraw support for insurance companies not willing to accept an industry price. They also wanted commissions billed by direct insurers to reinsurers as the costs associated with their premium volume to be 'reduced in the future to the rate' that the direct insurers actually paid their own agents. According to their plan, insurers would also be required to 'specify the total they kept for their own account on the risk in question for every reinsurance activity'. To ensure that all conference participants knew how the insurance companies reacted to these demands, they decided to 'mutually share the answers received from customers within the shortest time possible.'²² They now wanted to meet once a year and planned the next meeting for June of the following year with the proviso that an emergency meeting could be convened if necessary.

These plans came to nought. It was probably clear to all participants and those who had requested a copy of the minutes that there would be nothing to do at another

²⁰ *Rundschau der Versicherungen* 1868, 560.

²¹ The reinsurers were referring here to a large fire in warehouses in Bremen. *Rundschau der Versicherungen* 1868, 560. For more on the accumulated fire claims in the summer of 1868 and the insurance losses, see Straumann 2013 in this volume.

²² *Rundschau der Versicherungen* 1868, 561.

meeting, except repeat the demands and resolutions of Munich. As vital as this was in the eyes of the reinsurers, it must have appeared as inconsequential to most direct insurance companies.²³

3 ORGANIZATION OF THE INSURANCE MARKET

The follow-up conference in Berlin, which had originally been scheduled for June 1869, was held in 1899, three decades later. On reflection, the conference in Munich had only showed the weak position of the reinsurers vis-à-vis their customers and how dependent they were on contracts offered to them by direct insurers.²⁴

The *Annalen des gesamten Versicherungswesens* magazine for the insurance industry reported on the meeting of the reinsurers in Berlin at the end of October 1899. The publisher of the magazine printed a letter written to the fire insurance companies by the reinsurers with a long editorial introduction. In this introduction, the editors expressed sympathy for the concerns of the reinsurers and euphemistically spoke of their 'sad situation' and that they had expressed 'very modest requests.' Ultimately, these requests were anything but modest. In fact, they were demands accompanied by threats. The reinsurers no longer wanted their problems to be interpreted as those of the insurance industry as a whole. They, along with some of the direct insurers, were simply no longer willing to accept the practices of the fire insurance companies. The tone of shared concern that had been so pronounced in their letter from 1868 was missing. The reinsurers believed that it was not unclear rules or boundary issues that were at fault for the miserable situation, but the devastating practices of the direct insurers in underwriting large industrial risks. They urged the direct insurers to raise their premiums because 'colossal sums' were being underwritten on risks, particularly for industrial facilities, that the insurers would then 'immediately and almost entirely saddle their reinsurers with.' The grievances of the reinsurers were also found to be 'all too justified' by the staff at the *Annalen*. One could only hope that the situation would improve.

The editors at the *Annalen*, which acted as the mouthpiece of direct insurers, showed sympathy for the complaints about how large industrial risks were dealt with. The only criticism the editors had for the reinsurers was the fact they had not dared to label the 'dreadful state of affairs with the brokers,' who functioned as independent intermediaries for contracts between direct insurers and reinsurers, as the greatest evil.

²³ The supervisory board of Swiss Re qualified the lack of results from the Munich conference saying that they fact that 'our situation was acknowledged' was important enough. 'The direct institutions have shown that they are not completely indifferent to the steps we take both in their private statements on the conference resolutions as well as in articles appearing in trade journals.' SRCA 10.107 758, Meeting minutes of the board of directors of Swiss Re (hereafter BoD), 30 January 1869.

²⁴ *Annalen des gesamten Versicherungswesens* 1899, 816-17. Arps 1965, 292-3.

The *Annalen* wanted to spare the fire insurance companies at least some of the outrage coming from the reinsurance directors and redirect it toward brokers. With their strong network of contacts, they diminished the profits of both the direct insurers and the reinsurers.²⁵ Perhaps the magazine had hoped to find a suitable scapegoat at the last minute and thus prevent the problem from having to be solved by the insurers alone. The full text of the reinsurers' lament about their 'state of emergency' on the fire insurance market was still printed and it was also mentioned that the letter had been sent to the fire insurance companies meeting in Dresden. This time, the reinsurers' grievances were not just sent, they were also received.

The letter stated that even though the fire insurance industry had expressed sympathy for the problems of the reinsurers, it had also continued to underwrite large industrial risks with insufficient premiums and then passed them along to the reinsurers. As a result, the diverse nature of the directly insured risks had become unmanageable and, 'despite the best intentions of individual companies,' it has only remained an aspiration to hope for 'the introduction of standard premium rates based on empirical data that are necessary to create a healthy situation.' This was regrettable because the 'applied premium rates did not adequately account for the changes in many industrial companies brought about by technical progress in the last few years and thus the increased risks.'²⁶ These 'accumulations in value' could be attributed to the fact 'that individual fire claims had reached horrendous sums in the last few years' and had to be covered almost exclusively by the reinsurers.²⁷ According to the reinsurers, large risks had to be distributed more effectively and this was only possible if several companies participated in a risk. 'The greater the number of companies that shared in insuring a risk, the larger the group of reinsurers became, which made it possible to spread the risk evenly.'²⁸

There is nothing wrong with this analysis in insurance terms. It is surprising, however, that it was diametrically opposed to the recommendation from the Munich conference. While the demand in 1868 was that insurance companies themselves should not conduct retrocessions and should leave the field to the independent reinsurers, they now demanded the exact opposite, namely a distribution of large risks among direct insurance companies. The reinsurers must have realized that the exclusive responsibility for all forms of reinsurance contracts they had once demanded would have fatal consequences for the reinsurance branch. The high net losses in fire reinsurance, which were mainly attributable to industrial claims, but still produced modest profits for the fire insurance companies, led to a collective learning process.²⁹ The idea of shared and harmonious prosperity achieved through clear segregation of activities and extensive specialization alone had come to an end. To restructure reinsurance in the fire insurance branch, it wasn't enough to establish clear rules for cooperation and keep reinsurance as separate as possible from direct insurance. The situation of the reinsurers would only

²⁵ For more on the agent or broker system, see Pearson 2014. ²⁶ *Annalen* 1899, 816-17.

²⁷ For more on the losses, see Arps 1965, 292. ²⁸ *Annalen* 1899, 817.

²⁹ Arps 1965, 292. German reinsurance companies posted a loss of DM 1.45 million in the fire insurance business in 1899, these losses increased to DM 3.16 million in 1900, Arps 1965, 292.

improve if the direct insurance business was reorganized. To achieve this, the reinsurers wanted uniform premium pricing for industrial risks to be defined to 'create healthy conditions' in fire insurance.³⁰

This was literally playing with fire. Establishing uniform premium pricing would require industry-wide limitations on open competition. The prices were either too high and slowed the growth of the industry or they were too low at the expense of the reinsurers. However, in Berlin, the reinsurers made it clear that the only way to 'guarantee capable reinsurers with proven reliability and stamina' was to form healthy premium structures.³¹ The 'united front of reinsurers' connected the recommendation to establish tariffs among the fire insurers with the consideration 'to potentially withdraw from the fire insurance industry all at once'. This must have been quite a bombshell for the fire insurance companies meeting in Dresden because their departure would have inevitably led to the collapse of the fire insurance industry. The fire insurance industry responded immediately. The 'Vereinigung der in Deutschland arbeitenden Privat-Feuer-Versicherungsgesellschaften' (Association of Private Fire Insurance Companies in Germany) formed in 1899 issued a range of minimum prices for a number of industrial branches; the first one for the textile industry in 1900.³²

The fire insurance companies, in the words of Ludwig Arps, represented the only insurance branch 'that did not fail in the cartel school before the First World War' even though this cartel was in no way so loose 'that it wouldn't have demanded the strict discipline of its members, which so often spoils the fun of cartels'.³³ At least it can be said, however, that the letter from the reinsurers in Berlin had an impact on the structure of the fire insurance market. Other branches of insurance also tried to organize themselves more effectively. At the end of the nineteenth century, it was generally accepted that reinsurance was a necessity for the development of industrial, growth-driven economies and that it could set the tone for key issues involved in organizing the insurance industry. In the highly interconnected structure of organized capitalism it had carved out an important role, surprisingly without having any of its own instruments for formal organization. There was no magazine for the unique concerns of the reinsurance branch, no reinsurance conventions, and no regular formal meetings. Unlike the direct insurers, reinsurers hardly gave a thought to forming an association or setting up a price cartel that would have protected its interests, as widespread as corporatist thinking was among almost all economic theorists and political scientists at the end of the nineteenth century.³⁴ Ensuring the healthy organization of the primary insurance market with support from the reinsurers was regarded as the more effective approach.

There is a somewhat counter-intuitive answer as to why reinsurance companies were able to improve their position despite their low level of organization. It is that the

³⁰ *Annalen* 1899, 816–17. ³¹ *Annalen* 1899, 817.

³² Arps 1965, 293. ³³ Arps 1965, 571.

³⁴ For an example, see Wagner 1880; Schmoller, G. (1890), *Zur Social- und Gewerbepolitik der Gegenwart: Reden und Aufsätze*. Leipzig: Duncker & Humblot.

importance and weight of reinsurers increased in the last thirty years of the nineteenth century thanks to the growth, segregation, and ultimately the degree of organization of the direct insurance market.

Due to the reliance of industrial, growth-driven economies on statistics, the growth and rising importance of the insurance industry could be more or less estimated. For example, in industrialized Germany, which played a prominent role in the development of the reinsurance industry, the degree of insuredness is a clear gauge for the growth of the reinsurance industry. According to estimates from Ludwig Arps, German insurance expenditures were 1.66 per cent of per capital income in 1880. In 1890 and 1900, these figures were 3.02 per cent and 4.04 per cent respectively. Between 1880 and 1900, direct insurers roughly tripled their premium earnings. However, individual branches of insurance contributed to growth in extremely varying degrees. While the gross premium of the German insurance company and the reinsurance company more than tripled from DM 297 (1880) to DM 478 (1890) and then to DM 994 million (1900), fire insurance, which had originally been the most important branch of insurance in terms of share, was 'only' able to double its earnings from DM 135 million in 1880 to DM 268 million in 1900. In the same time period, the premium volume of accident and liability insurance increased ten-fold (from DM 5 to DM 45 million), thus showing growth similar to reinsurance. Reinsurance generated DM 20 million in 1880, DM 47 million in 1890 and DM 193 million in 1900, thereby posting almost 20 per cent of all gross premium earnings in Germany.³⁵

These statistics provide general clues about the development of the insurance industry but there would be differences in a comparison of industrial nations.³⁶ Despite these differences, however, it is clear that reinsurance companies made a disproportionately large contribution to the growth of the insurance market. Additionally, the insurance industry had considerably expanded its scope beyond the conventional branches of life, transport, and fire insurance by the end of the nineteenth century.³⁷ By then insurance policies were available to cover accident and liability risks, theft and water, storm and hail damage. And machines, loans, luggage, glass, and cattle could all be insured. Pension systems were also increasingly important in social insurance.³⁸

The establishment of separate institutions and the growth spurt had a significant influence on independent reinsurers by helping with the creation of new direct insurers. In doing so, they also helped indirectly to structure and stabilize the insurance market. With every new reinsurance and retrocession contract and with every activity in the direct insurance business, independent reinsurers enhanced their familiarity with the insurance market as a whole. The networking activities reinsurers needed to do in order to conduct their business limited the independence of the reinsurance companies but

³⁵ Arps 1965, 249.

³⁶ For more on country-specific histories of the insurance markets, see the World Insurance anthology of articles broken down by world region including France, Great Britain, USA, and Switzerland: Straus 2012; Pearson 2012; Kobrak 2012; Lengwiler 2012.

³⁷ Gerathewohl et al. 1979, 771.

³⁸ For more on property and asset insurance in the 19th century, see Manes 1931. For more on social insurance, see Manes 1932, 179–337.

also increased the organizational integration and stability of the insurance industry. It was corporate networks that coordinated the insurance market and ensured that the fast growth in the late nineteenth century remained more or less manageable, with help from the technical system of checks and balances provided by reinsurance business. The pure reinsurance business described by Grossmann with its clean divisions between direct insurance and reinsurance was often referred to and, in most cases, remained a myth.³⁹

This is also demonstrated by a shift towards a long-term contract model, intended to be trendsetting for the reinsurance industry and stabilize conditions in the insurance industry. It was the most important structural change in the reinsurance business and contracts at the end of the nineteenth century. Individual facultative reinsurance policies were systematically replaced by mutually obligatory general reinsurance policies.⁴⁰ Every risk was negotiated individually for facultative reinsurance. This meant the direct insurer decided on a case-by-case basis if he wanted insurance from a reinsurer and, if so, in what amount. The reinsurer also decided whether he would accept the risk and if so, in what amount and on which terms and premiums. Instead, for mutual obligatory insurance, a certain portfolio or parts thereof would be transferred to a reinsurer. Both parties would commit to cede and cover the agreed risks. The reinsurance companies would thus participate in the entire business of the direct insurer rather than taking on only very large risks.

At the same time the prevailing contract model was shifting. Munich Re introduced a new business model in the 1880s. The high commissions that the direct insurers billed to the reinsurers as the cost of setting up their expensive network of agents were reduced to a realistic level by allowing direct insurers to share in the profits of reinsurers. In addition, quota contracts gave relationships between direct insurers and reinsurers a long-term perspective—quota share reinsurance contracts involve the reinsurer in a percentage share of all the direct insurer's risks in a specific branch of insurance, independently of the amount of the insured total and the claims. In return, the reinsurer receives the same percentage of the original premium of the direct insurer.⁴¹ While it was difficult for the reinsurer to maintain an overview with this ongoing separation of the direct insurance market, it was precisely this specialization that made it possible to spread the risks across several branches of insurance more effectively. And it was ultimately the pricing in the insurance industry that led to higher premiums and thus to lower ceded risks. Although this meant that the reinsurers lost market share, they were in a position to conduct realistic risk assessment with their customers and balance out the distribution of risks between direct and reinsurers.

³⁹ See, for example, *The Review* articles from the 1930s that reminds the reader of the 'good old days' before World War I when professional reinsurers still clearly dominated the reinsurance business and the practice of reciprocity between direct insurers and professional reinsurers was virtually non-existent. *The Review* called for a return to the clear separation of the business activities of direct insurers and reinsurers so that the latter could fulfil its responsibility of protecting direct insurers over the long run. *The Review* 1933, 'The insurer and the reinsurer', 1142–6; *The Review* 1935, 'Reciprocity in reinsurance', 1190–1.

⁴⁰ Arps 1965, 213. See Gerathewohl et al. 1979, 1–3. Gerathewohl dates the origins of precursors to obligatory reinsurance back to the 1820s. What were known as 'continuous' reinsurance contracts existed at this time that covered a range of risks. See Gerathewohl et al. 1979, 757–68.

⁴¹ See Gerathewohl et al. 1979, 102–7.

Arps describes this restructuring of the conditions on the reinsurance market as follows: the reinsurance commission that allowed the direct insurer to pass on part of their actual costs 'lost its appeal as a source of occasional, intermediate profits. The addition of moderate commissions that allowed direct insurers to cover regular costs through profit-sharing reconciled the interests of both parties. ... The new kind of reinsurance created the prerequisites for ensuring that competition between the direct insurers was less devastating than before.'⁴²

At the end of the nineteenth century, there were structural reasons for tying a direct insurer to a reinsurer over the long term, despite short-term optimization constraints on the direct insurance market. Both the early (European) internationalization of the reinsurance business and the reinsurers' attempts to expand into direct business with North American insurance companies, rather than using European insurers, contributed to this development. The latter allowed the reinsurers to spread risks within a branch of insurance themselves. Small direct insurance companies were initially prevented from expanding due to the regulatory and organizational burden.⁴³ For reinsurers, on the other hand, the regulations were mainly restrictive in capital cover or state reinsurance monopolies prevented expansion to foreign markets. Where this was not the case, nothing or almost nothing stood in the way of globalization.⁴⁴

With their newly strengthened position, reinsurers saw the first signs of improvement. Not a small number of reinsurance companies started participating in primary insurance companies in the 1890s and believed they were responsible for guiding the industry as a result of their market knowledge.⁴⁵ What would have been unthinkable in the early phase of the formation of independent reinsurers was now possible as a form of symbiosis. Earlier it would have been perceived as the 'tail wagging the dog'. While Grossman only discussed the needs of direct insurers in his report from 1863, saying the reinsurers should only be used 'to divert direct insurers' excesses of loss', several reinsurers proved to have a different idea when the San Francisco earthquake hit in 1906. Under the 'follow the fortunes' clause, the reinsurers were obligated to automatically help finance the payments made by the primary insurers. Insurance companies could thus more easily agree to pay claims, knowing that the reinsurers would have to pay a part. The reinsurers therefore demanded the right to prescribe rules for direct insurers regarding their payment obligations so as to ensure that no unmanageable losses would arise, for either direct insurers or reinsurers, from earthquake claims. Even though they were willing 'to support those to whom we provide reinsurance in safeguarding their interests, even with sacrifices on our end', the goodwill relating to their payment practices 'may not be exaggerated'.⁴⁶

⁴² Arps 1965, 214.

⁴³ For an overview of direct and reinsurers in the 19th century in Europe and the USA, see Pearson and Lönnborg 2008, particularly 73–83.

⁴⁴ For more on the early international distribution of the reinsurance business using the example of Swiss Re and Munich Re, see Gerathewohl et al. 1979, 744–6.

⁴⁵ Gerathewohl illustrates this using the example of Munich Re in forming reinsurance companies including Allianz Versicherungs-AG in 1890. See Gerathewohl et al. 1979, 747–8 and 771–3; Arps 1965, 216.

⁴⁶ Grossmann 1863, 2; SRCA 10.144 430.02, Das Erdbeben von San Francisco, Kollektivschreiben von Rückversicherern, Frankfurt am Main, 30 April 1906, 1–3. Quote page 3.

With accelerated growth in the insurance industry, the market conditions at the end of the nineteenth century developed in the reinsurer's favour. As the insurance business stabilized, it also solidified as a whole. However, it was striking that the reinsurers still did not have any noteworthy traces of an industry structure. Not even a stable communication platform existed. But it would be premature to conclude from the low level of organization among the reinsurers that there was a complete lack of market coordination. Or to assume that free competition among the reinsurers alone had led to the conditions that were regarded as 'healthy' in the insurance industry. As 'suppliers of the insurance companies' (Manes), that is, as suppliers of 'semi-finished products' which the insurance companies turned into 'finished products', reinsurers did not need their own industry structure because direct insurers ensured that they would not mutually drive one another to ruin. The reinsurers integrated the entire insurance industry with their long-term and obligatory contracts. They brought stability to the industry without needing any coordination mechanisms specific to the reinsurance industry.⁴⁷

This can be seen by the impact of the two reinsurance meetings in 1868 and 1899. While the announcements of the reinsurers in 1868 were politely acknowledged as a triviality, the reaction of the fire insurers to the Berlin conference in 1899 showed that the insurance companies had become dependent on their 'suppliers', without a need for formal industry organization. They were the ones who had to cover the costs of market coordination. As a branch of the insurance industry, the reinsurers hence still remained visible only to specialists in the insurance industry, without giving themselves any appearance of formal organization. As the former vice-director and later director and chairman of the supervisory board of Swiss Re, Charles Simon, expressed it, even the relationships to the direct insurance representatives were driven to a large extent by personal relationships, based on mutual trust, where the transition from social matters to business matters was generally not difficult.⁴⁸

4 BAPTISM OF FIRE FOR MODERNITY AND INTERNATIONALIZATION

Just a few years later, this arrangement was put to the test when California felt the earth shake like almost never before. The handling of the San Francisco earthquake of 18 April 1906 is, quite rightly, considered a milestone in the history of insurance. The damage was unprecedented—initial estimates at the time put the cost at over USD 470 million for American companies, equivalent to almost four times the state of California's public

⁴⁷ Manes 1930, 210. 'The relationship between the reinsurer and the direct insurer can be compared to that of the semi-finished product manufacturer and the finished product manufacturer. In both cases, the division of labour leads to an intensity of the production process; in both cases the overall performance of the finished product manufacturer (direct insurance) is dependent on the semi-finished product manufacturer (reinsurance).' (Translated quote).

⁴⁸ Simon 1934.

spending that year.⁴⁹ Well over one hundred fire insurance companies were affected by the disaster.⁵⁰ According to a survey of sixty-nine companies by the *Österreichische Versicherungs-Zeitung*, the net losses of the survey participants alone amounted to USD 143 million. Premium revenue for these companies from the respective policies in the year prior to the earthquake measured around USD 2 million—the San Francisco earthquake was quite clearly a hundred-year event.⁵¹

The earthquake was also a huge shock for the modern city of San Francisco. The city had excellent infrastructure, impressive landmark architecture and shopping streets, elegant residential areas and efficient city administration, including a well-organized fire brigade. Of course, the modernity of the wealthy city also meant that there was a high level of insurance cover and extremely high premiums.⁵²

It seemed an El Dorado for fire insurers where they would make handsome profits. In 1905, 73 per cent of premium income in San Francisco was used for reserves and profits.⁵³ There was no reason to think that 1906 would be dramatically different. Even more unexpected was that an earthquake could turn the city into a sea of flames. It was precisely the city's modernity that made the consequences of the catastrophe even more severe. A modern city's infrastructure was not built for earthquakes, and San Francisco's infrastructure actually intensified the fatal effects of the disaster: the water supply broke down, telephone networks were cut off, paralysing the alarm system, short circuits lead to widespread fires, gas leaks exploded, and existing fires sparked new ones. Due to the lack of water, the only way to handle the flames and prevent the spread of the fire was to demolish entire streets. At breathtaking speed, the city was consumed, burning for days until there was nothing left to burn—and racking up expenses for the international insurance community. 'Not in history has a modern imperial city been so completely destroyed,' reported eyewitness Jack London in *Collier's Weekly*. 'San Francisco is gone. Nothing remains of it but memories and a fringe of dwelling-houses on its outskirts.' Everything that had once represented modern urban life was as good as gone. 'Its industrial section is wiped out. Its business section is wiped out. Its social and residential section is wiped out. The factories and warehouses, the great stores and newspaper buildings, the hotels and the palaces of the nabobs are all gone.'⁵⁴

⁴⁹ SRCA 10.144 428.01, letter from the NZZ editors to Swiss Re, 23.4.1906. See: Frankhauser, W. C. (1913), *A Financial History of California: Public Revenues, Debts, and Expenditures*. Berkeley, CA: University of California Press, 406.

⁵⁰ Arps 1965, 652; Röder 2012, 47.

⁵¹ *Österreichische Versicherungs-Zeitung*, 1906, No. 246. Quoted from Röder 2012, 74.

⁵² Fradkin 2005.

⁵³ Röder 2012, 46. In the state of California as a whole, insurers had achieved an average premium of almost 1 per cent. By comparison, in 1905 average premiums were 10 per cent in North America, 4.5 per cent in Norway, 4 per cent in Sweden, 3 per cent in Austria-Hungary, and 2.1 per cent in Germany. Between 1901 and 1905, more than 61 per cent of premium income remained for insurers in California to use as profits or for reserves. Their quotas were higher than those on the West Coast of America (58 per cent) and higher still compared with the US average (56.19 per cent). Röder 2012, 46.

⁵⁴ *Collier's Weekly*, May 5, 1906. Quoted from Röder 2012, 49.

Facing this widespread destruction, the phrase 'nothing remains of it but memories' can easily be dismissed as a poetic cliché. But it also points to the fact that San Francisco not only had a highly developed urban infrastructure in place, but also a strong, even 'imperial' memory that was closely linked to a powerful administrative, political, and legal regime.⁵⁵ The power of procedural knowledge forms the foundations of every modern city. The memory of this was therefore also of central importance for San Francisco's future. The planning machinery for rebuilding the city was put into motion just a few days after the earthquake, long before it could be gauged exactly what the consequences of the catastrophe were to be from an actuarial perspective.⁵⁶ The city also made use of its procedural knowledge to clarify insurance issues and was thus able to redefine the somewhat weak causal link, from a legal perspective, between earthquake and fire that had become apparent in the catastrophe. Far beyond the scope of the insurance treaties, a variety of media and legal tools were employed to produce facts that had been brought into question by the fire insurers' policies.

For those affected in California, there was no doubt that the earthquake led to the fire, the fire caused the catastrophe and the catastrophe demanded a pay-out by fire insurers. Representatives of European reinsurers, however, who had quickly assembled in Frankfurt, maintained that fire caused by an earthquake was not covered. They said that it was standard practice to exclude earthquakes from fire insurance policies. Even when it was not explicitly stated, they argued that this principle should be taken as implied, and that this was in line with normal legal practice and numerous national laws. The reinsurers therefore warned direct insurers that no claims were to be honoured unless concrete grounds were present to do so, that is, unless an express contractual obligation had been agreed.⁵⁷ 'Legally, therefore, the question is not at all whether loss by earthquake is excluded by the conditions of the policy or not', stated the reinsurers, 'but rather whether the undertaking of liability for such loss is expressly agreed to in the policy or not.'⁵⁸ Even at this point, however, the reinsurers suspected that the legal arguments presented would not suffice, no matter how watertight their case. The crucial issue was not what was written in the treaties, but rather what the implications were for the future of the industry. They conceded: 'We quite understand that considerations for the continuance without complaints by the insuring public of a large existing business cannot and should not be neglected in the decision upon the question of liability for the San Francisco losses, and we therefore do not demand that our legal standpoint, which we consider the only correct one, be applied in its full strictness.'⁵⁹

The claimants, lawyers, inspectors, experts, and judges were extremely quick to counter the reinsurers' legal argument by first breaking up the causal chain and then patching it back together in a way which served their purposes. All agreed that there was a fundamental connection between the earthquake and the fire. It was also accepted that the

⁵⁵ Fradkin 2005.

⁵⁶ Röder 2012, 50.

⁵⁷ *The Review* 1906, 238.

⁵⁸ *The Review* 1906, 238.

⁵⁹ *The Review* 1906, 238.

reinsurers had grounds for their arguments. But for each individual case and before the court, it was always easier to attribute the damage to the fire alone and not to the earthquake and fire combined. In general, it was impossible to produce convincing forensic evidence from the ashes of a destroyed house that only the rubble of a building already destroyed by the earthquake had been burnt. Given this consistent lack of evidence in the courts, direct insurers, particularly English ones, began to pay the San Francisco damages in full, hoping to be able to make ends meet through the use of cost-effective package solutions. In so doing, they triggered a market shake-out and thereby secured access to the upcoming boom in fire insurance in California. Because one thing was clear to everybody: insurance companies that did not pay out in an emergency would no longer be able to conduct business in North America. 'The question of liability for this colossal earthquake damage, which ultimately cost one billion in compensation, was a contentious one because of the ambiguous earthquake clause (only Helvetia's was iron-clad)', recalled Charles Simon, then chairman of Swiss Re. 'Royal, under the leadership of Mr Alcock, took advantage of its power and universal recognition and declared they would pay "the face of the policy, dollar for dollar", without deductions; the English companies and most American ones followed suit. That's when I understood the meaning of size in insurance.'⁶⁰

The willingness of direct insurers to pay while relying on the future market entailed obligations for reinsurers. The inviolable rule of the reinsurance business was 'follow the fortunes'. It demanded that a reinsurer must always, without fail, pay out in the event that the direct insurer decides to pay.⁶¹ Moreover, the reinsurers had already played their trump card—their legal case—and this, combined with the fact that the American courts dealt with direct insurance policies and not reinsurance treaties, meant that reinsurers were left holding a poor hand. There was thus nothing left for the reinsurers other than to accept the direct insurers' willingness to pay, to compensate them in accordance with the reinsurance treaties, and to make sure that the issue of earthquakes was dealt with in unambiguous terms in future fire policies. As part of a complex editorial process, an 'Earthquake Commission' set up by the reinsurance companies collected, sorted, and

⁶⁰ Simon 1934, 47. Twenty-five years after the San Francisco earthquake, a fierce debate flared up among insurance companies over the varying degrees of willingness to pay and who had compensated policyholders, when and why. See the article in *The Review* entitled 'The German Companies and the San Francisco Earthquake Disaster of 1906', *The Review* 1931, 396.

⁶¹ Precisely when there was cause to make an exception, this principle was time and again dealt with in the trade press. A concise example, drawing on the commentary on insurance treaties by Erich Prölss (Prölss 1954), can be found in an article in *The Review* on the structural crisis in the insurance industry at the end of the 1960s: 'Every obligatory reinsurance treaty, whether proportional or non-proportional, imposes on the reinsurer by necessity (this is contained already in the term "obligatory") a duty to "follow the fortunes" of the direct insurer, no matter whether this is expressly stipulated or not. On closer inspection, however, this duty falls into two parts: on the one hand following the fortunes in the true sense, in which the reinsurer must accept everything which affects the circumstances of the direct insurance without any intervention by the direct insurer, in particular the loss occurrence itself, increase of risk, etc., and on the other hand following the actions of the direct insurer, i.e. everything which he can influence such as the risk selection, premium policy, the retention and the reinsurance policy, and loss settlements.' Grossmann 1969, 95 (translated quote).

compared all existing earthquake clauses, looking at their legal tenability. A harmonized version was then drawn up in a number of languages.⁶²

Without doubt, the work carried out by the Earthquake Commission was an important step towards the standardization of international insurance law.⁶³ But this was small consolation given the massive damage that the San Francisco earthquake had done to the international insurance industry. The impact of the earthquake clause on the future course of the industry was probably limited—in the event of a large loss, many other factors come into play in clarifying whether an insurance company must compensate its clients or not. The San Francisco earthquake is nevertheless of interest and significance for the history of the reinsurance industry. First, the letter from reinsurers to their clients was sent just twelve days after the earthquake, on 30 April 1906. In other words, if necessary, reinsurers were able to get together in a short space of time to decide on joint action. Second, San Francisco presented a further learning experience for the industry, leading to the formulation of a collective strategy. Third, the letter from Frankfurt revealed a huge systematic difference between the continental European reinsurance companies that had met in Frankfurt and the English co-insurance system behind the English fire insurers active in San Francisco that had been willing to pay out. This difference could be attributed to the gap between the relatively modest volume of the continental European insurance market and the vast London market. Until then, London had treated the North American reinsurance business as somewhat peripheral, since the direct insurance business was lucrative enough and the co-insurance system alone was sufficient to absorb large loss events, as proven by San Francisco. It also again confirmed the view that reinsurance was a new organizational form of insurance that would help eliminate growth limitations in direct insurance. With its small national markets, growth was much more limited on the Continent than in the British Empire, which had already been active for quite some time in the field of shipping insurance, both in its colonies and more widely.⁶⁴

At the start of the twentieth century, independent reinsurers were thus firms that provided support to small, national and regionally-based direct insurers, enabling them to grow. By contrast, the larger English insurance companies also participated in the growth of the insurance market by means of the traditional tool of co-insurance.

The lessons that the insurance industry had to draw from the earthquake in San Francisco were by no means easy. It became clearer than ever for direct insurers that converting hazards into risks using actuarial techniques was challenging. It could not simply be done by calculating the premium by adding organizational costs and the cost of capital to the product of the statistically derived probability of occurrence and potential losses.

⁶² The initiators of this project—the directors general of Swiss Re, Cologne Re, Badische Re, and Co-Insurance Company—gave themselves the title ‘commission’, although it was not set up as an official body. T. J. Röder 2012, 119–23.

⁶³ For greater detail, see Röder 2012, particularly 118–50.

⁶⁴ For more on the British Empire and the global expansion of the insurance business, see Borscheid and Pearson 2007 and Pearson 2012. For details on co-insurance as the functional equivalent of reinsurance, see Hollitscher 1931, 19–21 and 126–30.

San Francisco brutally showed that, beyond actuarial techniques, issues of causality, legislation, reserves, treaties, politics, organization, past income, current losses, future profits, threats from competitors, and limited cooperation also had to be taken into account.

This array of issues was also, of course, of crucial interest to the reinsurance industry. Above all, however, the San Francisco earthquake made it clear to continental European reinsurers which risks were actually linked to the internationalization of their business. Their former growth strategies were not exactly mistaken. But it had become clear that the challenges of the American market had been underestimated, particularly as regards the courts and legal system. For Charles Simon, who had relied on this market for quite some time, the earthquake in California not only led to a heavy loss of CHF 4.3 million, but also to a complex process of crisis management with his beleaguered partners at Helvetia Feuer in St. Gallen.⁶⁵ For a period of time, just like several direct insurance companies, Swiss Re withdrew from the US market.

The earthquake also had an unexpected consequence for the reinsurance industry: the Earthquake Commission represented the potential beginnings of increased cooperation between reinsurers and did have some effect on the level of industry coordination. But, to begin with, the industry did not make use of this interactive platform for any other matters. Perhaps the Commission was simply too specialized, although it could have expanded its mandate to also deal with more general industry issues. What the reinsurers needed to do from an organizational perspective, however, was to review the organizational methods they had been using up to that point to implement their growth strategies. The opportunity to expand the business beyond Europe and thus spread risk globally was one that was too good to miss. But, it was quite clear that the reinsurance companies and their industry lacked the organizational strength to do this. In order to successfully make the leap to the US, close cooperation was required not with competitors but with an established direct insurer that was able to underwrite and cede risks locally. They needed a local player who was in a position to judge effectively the relationship between premiums and potential losses. It was precisely the combination of reinsurance and direct insurance functions that made the difference for most English insurance companies in their handling of the events in San Francisco.

The industry thus began to organize itself in a way that would characterize it for many decades: ‘independent’ reinsurers sought to pair themselves up with direct insurers in order to act in concert in the international market. The internationalization of the reinsurance business was coupled with the ‘multinationalization’ of the direct insurance business. In the years leading up to the First World War, a complex landscape of new alliances and collaborations between reinsurers and direct insurers emerged. This was not a return to the old model whereby reinsurance companies were established as subsidiaries of direct insurers. It was more a reversal of the relationship: reinsurers obtained shareholdings in direct insurance companies, established subsidiaries in the direct market, as

⁶⁵ Simon 1934, 20.

exemplified by Munich Re as early as 1890, or signed cooperation agreements with strong partners in the direct business.

Swiss Re also followed this method in a second attempt at operating in New York, indirectly via London. The company made a contractual agreement with Phoenix, one of the large London fire insurance companies. Phoenix had withdrawn from the market after 1906, probably due to disastrous misjudgement regarding the future North American market, and now needed a strong and secure reinsurer licensed in the US in order to re-enter the market.⁶⁶ In its report to the meeting of the board of directors on 3 March 1910, the executive board of Swiss Re stated that the issue of restarting reinsurance activities in the US had progressed 'in that London-based Phoenix, with whom we have multiple connections and a trusted relationship, is about to reorganize its insurance cover as part of its restructuring of the management of its US operations and is prepared to sign a contract with us in this regard'. However, Swiss Re would have to 'obtain a license in the US as soon as possible by depositing the USD 500,000 required by law'. This was not considered possible at that time 'since, as a precautionary measure, we wish to first wait for the definitive conclusion regarding the outstanding issue of the San Francisco losses, so as not to risk getting into difficulties as Helvetia's reinsurer'.⁶⁷

The shadow of the San Francisco earthquake thus hung over the entire strategy of internationalization. The catastrophe led to massive restructuring across the entire insurance market. Independent reinsurers intensified the strategy they had been following since the end of the nineteenth century of holding shares in direct insurance companies and established international insurance empires with holding-like structures. Between 1920 and 1930, the insurance industry—led by the reinsurance companies in continental Europe—transformed itself into a dense network of international shareholdings and cooperation agreements.⁶⁸

This combination of direct insurance organizations and cooperative networks operated by reinsurance companies partly explains the informal organizational structure that characterized the reinsurance industry well into the twentieth century. It was enough to ensure coordination and cooperation on insurance markets and, as long as the increasing internationalization of the industry could compensate for fluctuations in demand growth, there was no reason to establish an organizational structure specifically for reinsurance.

⁶⁶ As an alternative, Swiss Re considered forming an alliance with Preussische National, which had established itself in Chicago. Swiss Re, Committee, 21 January 1910, 17. Quoted from Straumann 2013 in this volume.

⁶⁷ SRCA 10.107 762, Annual Report for the annual meeting of the Swiss Re board of directors of 3 March 1910, 309–11.

⁶⁸ Windolf 2002. Swiss Re owned four branches in the United States (Swiss Reinsurance Company, Prudentia, European, and North American) and one branch in Germany (Bayerische Rück), France (C.F.R.G.), and in Great Britain (Mercantile & General), respectively. It held participating interests in ten life insurance companies, nine fire insurance companies, two casualty insurance companies, three health insurance companies, two credit insurance companies and four multi-line companies. Quoted from Straumann 2013 in this volume, p. 283.

5 DEGLOBALIZATION, POOLS, RETROCESSION, AND GROUPS

The outbreak of the First World War in 1914 signalled not only the end of the nineteenth century and the *belle époque*, but also the conclusion of the first, European-dominated phase of globalization.⁶⁹ However, except for in Germany, the First World War did not represent such a watershed in the history of reinsurance. The 54th annual report of the board of directors of Swiss Re, reporting on the 1917 business year, barely even mentioned the war.

The report stated that marine had continued to face quite some difficulties, fire had reported a large loss in Thessaloniki, which might lead to higher premiums, and profits in accident and liability had compensated for the losses in burglary and theft. 'The results from the life business were also satisfactory: the mortality rate was low and war deaths had little impact. New business is stronger than ever,' was the executive board's curt commentary. To find mention in the report of changes induced by the war economy, such as the huge increase in the cost of living, requires a careful eye: 'The marked increase in administrative costs resulting from the upturn in business, the general rise in prices and the allowances paid to employees as a response stood in contrast to significant growth in interest income.'⁷⁰ The First World War did cause a shift in market shares among reinsurers. German reinsurers temporarily disappeared from the international scene altogether and after the 1917 October Revolution, business in Russia had to be abandoned. But for the industry as a whole, there was no dramatic change.

The consequences of the First World War terms of economic policy were much more grave, however, and could be summarized under the heading 'protectionism and nationalization'. Following the war, new trade barriers were continually being devised, workforce migration was heavily monitored, and international capital flows were controlled—right up until the international financial system collapsed.⁷¹

Since the conclusion of contracts with foreign reinsurers was considered to weaken the balance of payments, many countries began to put limits on the freedom of contract within the insurance industry. Exchange control measures were also used so that existing contracts could not be fulfilled and that new contracts could only be concluded with national reinsurers, who then in many cases found themselves holding a monopoly. This represented a huge restriction on the business of

⁶⁹ Osterhammel 2009. Borscheid 2007 provides a qualified thesis on de-globalization.

⁷⁰ Swiss Re, Annual Report 1917, 15 June 1918, 3.

⁷¹ 'As the result of the interwar trade trends, western Europe's share of world exports declined from 60 per cent in 1913 to 41 per cent in 1950, highlighting one of the structural changes in the world economy brought about by two world wars and the Great Depression: the shift of the centre of the world economy away from western Europe.' Feinstein, C. H., Temin, P., and Toniolo, G. (2008), *The World Economy between the World Wars*. Oxford/New York: Oxford University Press, 13.

reinsurers that were active abroad, especially since plans were being developed in France, Belgium, Greece, Brazil, the Baltic countries, and Sweden to transform the private monopoly within reinsurance into a state-owned one, thus closing down the market.⁷²

Moreover, the consequences of dealing with the war economy and the turbulent reintroduction of the gold standard were particularly severe for the reinsurance industry. Along with inflation and hyperinflation in the early 1920s, the restrictions on international payments were also of particular significance, as demonstrated by the strict exchange controls in the 1930s. International transfers of reinsurance funds, whether premiums or compensation, had to be secured using clearing contracts. This created a large administrative burden and led to lengthy payment delays and resulting value date losses. Despite the currency control measures, Swiss Re, most of whose customers were outside Switzerland, was able to transfer 'all balances from Italy, Czechoslovakia, Denmark, the Baltic countries, Romania, Japan, Chile, Uruguay, Brazil, and Mexico' at free market exchange rates. This was only partially possible for Poland, Greece, and Turkey, while funds in Hungary, Yugoslavia, and Bulgaria were completely blocked and 'a work-around' was found to release them in the 'most cost effective manner', albeit 'with large value losses'.⁷³ As an alternative to clearing, reinsurers also began to set up deposits with their clients. However, deposits presented a range of difficulties. They carried higher investment and currency risk, generated only limited income as cash deposits and were subject to deductions by the client for administrative costs. Securities deposits stored with clients were onerous for reinsurers. In addition, they had to be continually adjusted to the client's reinsured risk portfolio. Only the principle of currency matching (i.e. avoiding the continual conversion into other currencies of funds and liabilities in a country with an unstable currency or a high inflation rate) brought some relief.

The difficulties faced by reinsurers in the interwar period can be summarized as follows. First, inflationary trends made it difficult to make precise calculations for long-term liabilities; second, the international monetary system had become complicated; third, direct insurers in several countries were subject to limited freedom of contract through various means; and fourth, payment methods for contracts also often continued to vary from country to country. On all fronts, the international reinsurance industry was operating in an environment of special provisions and exceptions. Strategy development was difficult under these conditions and the energy of reinsurers was depleted by the efforts to adjust to the continually changing conditions in the reinsurance market and the broader political framework.

At first, this situation increased the demands on companies' organizational capabilities and also appears to have increased network and organizational pressure across the industry. Out of the wide array of potential instruments that could have aided cross-company organization and thus limited transaction costs—such as journals, meetings, reports, congresses, associations, or societies⁷⁴—reinsurance companies chose to use

⁷² Guggenbühl 1939, 173.

⁷³ Guggenbühl 1939, 174.

⁷⁴ Wagner 1880.

three instruments in the 1920s and 1930s that had a similar effect but were less visible: they signed a much larger number of retrocession treaties, established pools with other companies, and increased their holdings in other corporations, both in the direct and the reinsurance business. Overall, this led to a marked increase in the level of integration within the reinsurance industry.

Retrocession—the passing on of risks to another reinsurer—had played a key role for independent reinsurers since their foundation. But it was an instrument that was only grudgingly utilized if the ceded risk was too large, in relation to the premium volume and the company's own capital base and therefore needed to be split across a number of reinsurers. Reinsurers attempted to retain as much of the ceded risk as possible and to avoid retrocession, because it entailed sharing both risk and potential profit. So it is even more noteworthy that the use of retrocession increased dramatically among reinsurers in the 1920s and 1930s. For Swiss Re, 'the total sum of retroceded premiums between 1914 and 1938 was approximately thirteen times the respective figure for the period from 1889 to 1913'. This was not purely a reflection of the increased volume of business.⁷⁵ Between these two periods, the company's retrocession rate increased from 25.7 per cent to 40 per cent. However, from 1914 there were significant differences in reinsurance treaties across the individual business lines in terms of the usual retrocession rate. For fire, and marine, it increased to over 47 per cent, while for accident the figure was significantly lower at 23 per cent to 28 per cent.⁷⁶

The example of Swiss Re shows that recourse to retrocession increased substantially in the interwar period. It also makes clear that this evolved in line with the construction of group companies. The latter involved, among other things, reinsurers obtaining holdings in direct insurance companies, founding subsidiaries, and buying out competitors. Pools also provided a further important tool for the organizational differentiation of companies. They were set up across a number of group companies and were particularly popular in the fire business. These pools made it possible to distribute risks that were difficult to calculate across a number of subsidiaries or group companies according to a contractually defined ratio. Pools thus existed not only across companies but also within reinsurance groups, such as Swiss Re. In his history of Swiss Re, written in 1939 but never published, Paul Guggenbühl wrote that 'at one time both Group companies Prudentia and Europäische as well as the two foreign reinsurance companies Mercantile & General and Bavarian Re took part in a pool'.⁷⁷ Companies participating in a pool transferred their gross business to the group and in return shared in the group's premium income without retrocession to third parties. The main effect of the construction of pools from an underwriting perspective was that group companies did not have to conduct technical processing for the business they acquired and they received back a portfolio from the group, which was balanced and satisfied the underwriting criteria.⁷⁸

⁷⁵ Guggenbühl 1939, 177.

⁷⁷ Guggenbühl 1939, 177–8.

⁷⁶ Guggenbühl 1939, 177.

⁷⁸ Guggenbühl 1939, 178.

The construction of groups allowed for greater internal specialization in risk assessment and treaty acquisition and kept transaction costs to a minimum through the use of pools and retrocession. This provides a further explanation as to why the reinsurance industry continued to resist a formal organizational structure even during the economically challenging 1920s and 1930s.⁷⁹ Pools and retrocession allowed for a relatively cost-effective exchange of information closely related to the actual business at hand and thus increased the vertical and horizontal integration of a reinsurance company.

6 THE EXCESS-OF-LOSS PROBLEM AND THE ROUTE TO MONTE CARLO

The reinsurance companies of the interwar period can be considered financial service providers that, with their network of contractual relationships and integral corporate strategies, helped to reduce the complexity of the insurance market and its risks. They responded to the adverse economic conditions with vertical and horizontal integration, and to problems in the insurance market with a differentiation of their reinsurance techniques and increased use of non-proportional treaties. With these types of treaties, compensation payments were divided such that the primary insurer paid compensation up to a contractually agreed limit and the reinsurer was responsible for the 'excess of loss', that is, the amount in excess of the limit.

For an experienced reinsurer accustomed to obligatory, proportional treaties, the excess-of-loss approach seemed rather suspect. For example, in 1935, after one of his many trips to the US, Paul Alther, general manager of Swiss Re, commented that the new 'excess-of-loss treaties' represented a huge 'temptation' for direct insurers. He was already suggesting that reinsurers would be better off staying away from these kinds of contract. If direct insurers were so interested in them and American and English reinsurers were favouring them, then most likely it was just another instance of cut-throat fighting over premiums among reinsurers. The hungry 'cry for premiums' formed part of the competitive pressures that made it impossible to uphold 'our tried-and-tested principles', stated Alther. He considered 'the provision of cover for the excess of loss' to be the most dangerous form of competition at the time.⁸⁰

The excess-of-loss plan named after the American broker Guy Carpenter, for example, seemed completely obscure to Paul Alther. It was developed for the reinsurance of cotton insurance and was intended to spread the risk of a crop failure over a number of

⁷⁹ See Manes 1930, 217. By the end of the 1920s, a pool had already been formed in the Netherlands between the reinsurance companies *Nederlandsche Herverzekering Maatschappij*, *Tweede Nederlandsche Herverzekering Maatschappij*, and *Derde Nederlandsche Herverzekering Maatschappij*. See *Assekuranz-Jahrbuch*, 1930, vol. 49, 439. Quoted from Gerathewohl et al. 1979, 802.

⁸⁰ SRCA 10.170 172.17, Paul Alther, Bericht über die Amerika-Reise: Feuer-Rückversicherung, 1935, 7 (translated quote).

years. According to Alther, the Carpenter Plan represented 'the most popular type of excess-of-loss coverage' in the US, but it was practically impossible to adapt it to meet the differing insurance needs of other sectors. In the meantime, moreover, the one characteristic that identified a reputable reinsurer, namely the long-term perspective of the reinsurance treaty, had been let slip. 'The original condition that a treaty must be concluded over the long-term with premiums automatically adjusted each year in line with the loss ratio, so that it only amounted to the temporary financing of large losses', had also been abandoned. Despite his array of links to companies that used this plan, Alther's request to be granted a look at such a contract was in vain. 'The insurance companies reinsured under the Carpenter Plan are required to maintain the utmost confidentiality', added Alther. Clearly he considered this secretiveness among the Americans to be further evidence that the excess-of-loss technique was a rather dubious instrument for reinsurance treaties. It was also a cause of concern that Lloyd's of London had started aggressively marketing this tool too: 'Lloyds has been intensively and systematically promoting excess-of-loss cover for two to three years and it seems that the success in this area is now taking on dangerous proportions.'⁸¹

The significance and long-term effect of excess-of-loss treaties was still relatively unknown in the mid 1930s and was viewed with suspicion as the central element of a ruinous and reckless form of competition between competing reinsurers in the US and London. In fact, the mathematical processes involved in this reinsurance technique were anything but trivial and at times companies had to undergo taxing learning processes in actuarial mathematics. How do you calculate premiums and the necessary reserves for reinsurance treaties if the losses covered are no longer divided proportionally? It was possible to make a rough guess by simply taking the average of the claims that surpassed the limit in the past, multiplying this by a safety factor, and then carefully observing actual performance. In any case, the treaties would have to be renegotiated each year, surpluses reimbursed, and the premiums corrected where necessary. If this was not done, excess-of-loss treaties represented a huge risk in the reinsurer's portfolio. The right approach was to use an actuarial model for the distribution of losses and the probability of occurrence for all potential claims.⁸²

However, the increased use of mathematics in insurance, as a result of excess-of-loss treaties significantly worsened the communication issues within the reinsurance industry. With the theoretical development of the excess-of-loss technique and its practical implementation, the reinsurance industry was pushing the boundaries of existing knowledge. As early as 1945, *The Review* somewhat bravely provided its readers with an

⁸¹ SRCA 10.170 172.17, Paul Alther, Bericht über die Amerika-Reise: Feuer-Rückversicherung, 1935, 7-8.

⁸² 'Gradually, it became obvious that this procedure, solely based on averages of statistical experience, would not reflect the risk character of the non-proportional reinsurance treaty. Since the 1930s, actuaries took over modelling the full distribution of losses by a factor model, one factor being the loss frequency, the other the loss severity (size of loss). For both factors they developed probabilistic models, which then needed to be simultaneously applied to arrive at the reinsurance premium. This actuarial approach for rating non-proportional reinsurance treaties has since become standard.' Bühlmann and Lengwiler 2014.

explanation of an excess-of-loss model.⁸³ But when, in 1950, it reported on the modified use of such a treaty at Paternelle, it did so only with the greatest respect and also with moderate success. Evidently, more demanding actuarial mathematics was now also playing a role outside the life insurance business. This was a fact that could be accepted. But to understand what excess-of-loss treaties meant for the insurance industry, a relatively in-depth understanding of actuarial mathematics was required. 'It is thought by some authorities on excess-of-loss reinsurance', began the article in *The Review* on Paternelle's efforts in this area, 'that little progress will be made with that comparatively modern form of reinsurance until actuaries, used to thinking in decades, take a hand in the matter.'⁸⁴

One person that *The Review* numbered among the visionary actuarial mathematicians was André Thépaut, deputy general manager of Paternelle. In a lengthy paper, he had attempted to demonstrate 'that peak losses obey the law of average and that an excess-of-loss treaty can be built upon an actuarial foundation.'⁸⁵ The study included an impressive bibliography, which included works in this field from the previous ten to fifteen years. *The Review* wanted to give a summary of Thépaut's work, published in Paris by Dulac, in non-mathematical language, even if much of it remained unclear. The author himself had to admit that it was only on the basis of large-scale, practical experiments that it would be clear if the instrument could be used on additional or even all risks with potential total losses, 'such as personal accident (death risk), life assurance, total losses in marine insurance, burglary of strong rooms, all risks jewellery policies, aviation, etc.'⁸⁶

The more detailed *The Review's* comments, the clearer the gap was between the highly specialized actuarial reinsurance knowledge required in this area and the information that *The Review's* readers were able to digest.⁸⁷ What exactly did it mean that Thépaut's model rested on two ideas, 'of which the first is merely a new form of stabilization clause and the second and more revolutionary idea that the reinsurer's premium should be proportionate not to the risk premium income of the ceding office but to the product of the claim—arranged in descending order—which is agreed as the net retention and its number'?⁸⁸ Should all reinsurers now read Thépaut's original text and get involved in the discussion on how to combine the first and second Pareto theorems with the Galton-Macalister theorem and what this meant for determining the distribution of claims?⁸⁹ The type of information that could be discussed and developed in a specialist actuarial publication was no longer really suitable for the general insurance press.

The difficulty of trying to explain and understand the actuarial mathematics behind excess-of-loss treaties stood in sharp contrast to their appeal in the emerging direct

⁸³ *The Review* 1945, 23 November, 538–9, 'Excess of Loss Reinsurance: The "Tuma" System'.

⁸⁴ *The Review* 1950, 1011, 'The New Paternelle Excess-of-loss Treaty (ECOMOR)'.

⁸⁵ *The Review* 1950, 1011, 'The New Paternelle Excess-of-loss Treaty (ECOMOR)'.

⁸⁶ *The Review* 1950, 1011, 'The New Paternelle Excess-of-loss Treaty (ECOMOR)'.

⁸⁷ *The Review* 1950, 1011, 'The New Paternelle Excess-of-loss Treaty (ECOMOR)'.

⁸⁸ *The Review* 1950, 1014, 'The New Paternelle Excess-of-loss Treaty (ECOMOR)'.

⁸⁹ Thépaut 1950, *Une nouvelle forme de réassurance: le traité d'excédent du coût moyen relatif (écomor)*, Paris: Dulac, 15–16.

insurance market for motor vehicles. In this market, it was the unpopular liability insurance that was important, but most claims led only to small compensation payments that could be dealt with using standardized and easily streamlined administrative procedures. And although the margins for direct insurers were, for regulatory reasons, small, there was huge demand, which also had an extremely high potential for rationalization. All that mattered was that the rare large losses could be ceded to the reinsurer.⁹⁰

This was an uncomfortable situation for reinsurers. On the one hand, with excess-of-loss treaties, they could no longer automatically inspect the quality of the risks underwritten by the direct insurer, since whatever lay under the limit was the direct insurer's business alone. Reinsurers therefore needed to tap into new, independent sources of information—and in the climate of increased competition, this was no mean feat. On the other hand, it was well known that with non-proportional treaties, the risk of loss was higher for reinsurers than for direct insurers. That in turn meant that the direct insurance business became more attractive and reinsurers were not able to participate in economic growth to the same extent.⁹¹

Over the long term, this may also have been a reason why reinsurers began to look to new forms of information exchange among themselves and cooperation between individual companies. To do this they had to expand and formalize the existing networks, namely, to do exactly that which up to that point they had either avoided doing or had only done against their will in an emergency. However, networking attempts also came up against new problems. 'It is often asserted that reinsurers are wasting their time at international conferences', stated *The Review* in 1947, 'and perhaps as yet the organizers of the International Marine Insurance Union have not succeeded, from the point of view of reinsurers, in getting all the "right" people to attend the conference.'⁹² These international conferences did still make it possible to make interesting contacts, but the exchange of information among a growing number of reinsurers battling with complex technical issues could not be ensured simply on the periphery of a conference of marine insurers or some other specialist group. At the same time, it was no longer possible to keep secret the fact that brokerage companies had significantly increased the amount of brokerage activity they were conducting between direct insurers and reinsurers. They were taking a substantial chunk out of the reinsurance business for themselves. 'The managing director of one of these firms informs us that his executives last year crossed the Atlantic twelve times, which is something of a record for a private firm.'⁹³

The situation seemed so gloomy that some reinsurers, for the first time, entertained the thought of founding an international reinsurance association. The proposal came from,

⁹⁰ For details on excess-of-loss treaties within motor insurance, see *The Review* 1939, 1086–9, 'Excess of loss reinsurance cover' *The Review* 1992, 476–8, 'Excess of loss reinsurance'.

⁹¹ At the same time, insurance know-how was becoming more and more of a difficult issue from a sociopolitical perspective the more the direct insurance market became a mass market. For different reasons, both areas of communication lost relevance within the legal discussion. One of the last big attempts by lawyers to counteract this trend is described in the commentary on insurance treaties by Erich Prölss. See Prölss 1954.

⁹² *The Review* 1947, 253, 'The International Reinsurance Scene'.

⁹³ *The Review* 1947, 253, 'The International Reinsurance Scene'.

among others, Jaroslav Tuma, one of the most important actuarial theorists behind the excess-of-loss treaty. According to an internal Swiss Re memo, the idea had been much talked of in recent times but had come to nothing. A foundation assembly was convened in San Remo but failed in its attempts since only four countries had spoken out in favour of such an association, namely the Netherlands, Finland, Spain, and Portugal. 'You could be justified in believing that the widespread rejection of such an international association is so strong that no further attempts will be made,' stated Swiss Re.⁹⁴

The idea of an international reinsurance association seemed a non-starter. However, it was quite clear that existing publications were no longer in a position to continue improving coordination. At the same time, the interests of direct insurers and reinsurers were drifting further apart and the existing networks within the insurance industry played largely into the hands of the brokers, while reinsurers attended sector-specific conferences. This is precisely why it became pressing to create an alternative platform for communication, which would solve at least some of these problems.

It was the direct insurers in Europe that showed the reinsurance industry how this could work. In June 1951, they organized, for the second time, a large-scale meeting of 'national professional insurance organizations in Western Europe'. The conference, held in Brussels, was a rather large affair, 'excellently organized and run by the Belgian hosts, both on the business and on the social side.'⁹⁵ Industry representatives from seventeen countries explored the possibilities a supranational organization could open up for the development of their markets. The participants were particularly interested in the industry-specific recommendations made by the Organization for European Economic Cooperation (OEEC), set up in 1948.⁹⁶ They bravely decided to explore the idea of a multilateral 'convention of freedom for international insurance', but it was an idea that proved difficult to make a reality. However, it could probably have been set up and implemented more quickly with the help of the OEEC. The alternative was to wait until the national legislative machinery across Europe was in a position to concern itself with the liberalization needs of the direct insurance industry and could legally guarantee the desired freedom in the service sector.⁹⁷

The conference in Brussels may have been a milestone for some reinsurers. It showed what could be organized at the supranational level. When the first meeting was convened in Monte Carlo in 1957, by reinsurers that had also been present in Brussels, it was, however, not yet time to celebrate.⁹⁸ In fact, according to *The Review*, the meeting in Monte

⁹⁴ SRCA 10.101 630.02, E.F., San Remo. Allgemeine Eindrücke, 13, September 1949 (translated quote).

⁹⁵ *The Review* 1951, 487, 'European Insurance Collaboration: The Brussels conference.'

⁹⁶ The insurance-specific recommendations made by the OEEC in 1951 were still of a somewhat rudimentary nature and mainly concerned the regulation of payments. From 1952 to 1961 a 'Group of Experts on the Liberalization of Insurance Transactions' worked on a broad range of insurance issues relating to air traffic, motorized traffic, life insurance, insurance in other countries, marine transport, and nuclear risks, among others. See European University Institute (2001), *Inventory OEEC. Organisation for European Economic Co-operation*, Florence: OEEC. Available at: <www.eui.eu/HAEU/pdfinv/inv-oeec.pdf> accessed 27 June, 2013; Werner 2010.

⁹⁷ For further details, see the section entitled 'Liberalization of the direct insurance markets.'

⁹⁸ *The Review* 1951, 488.

Carlo was rather experimental and clearly still 'in its informative stages.' The journal and the organizers consistently spoke of a 'rendezvous of insurers and reinsurers', thus highlighting the call coming from the meeting in Monte Carlo that a new platform for the insurance industry be organized each year, which could have integrative functions.⁹⁹

The organizational committee of Monte Carlo appointed André Roux, then president of Assurances Générales de France, as chairman. Per M. Hansson was appointed a member of the organizational committee for the next meeting in 1958. It was he who would go on to make a splash in Monte Carlo ten years later with his unsparing analysis of the industry.

⁹⁹ Meetings between direct insurers and reinsurers held in Baden-Baden since the 1920s had, by contrast, been more of a meeting point simply to exchange treaties. Its international significance and reputation as a key event for the insurance industry cannot be compared with Monte Carlo. See also Chapter 8, this volume.

CHAPTER 8

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STRUCTURAL PROBLEMS AND DIAGNOSTIC DIVERSITY 1960-1980

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WHEN Per M. Hansson, director of the Norwegian company Storebrand Insurance, gave a summary of the structural problems in the reinsurance industry at the Rendezvous in Monte Carlo in the autumn of 1968, he pointed in particular to a notable discrepancy that had arisen contrary to all expectations. The disparity between fast-growing demand for insurance and falling returns within the reinsurance business was inexplicable, even paradoxical. Looking at the history of the insurance industry, the automatic assumption would have been that economic growth, an increasing concentration of assets, and technical change would lead to faster growth within the direct insurance business. Surely, only an expansion of reinsurance capacity could cover such an increase in demand for insurance. The booming economy of the post-war period should therefore have been a particularly good time for reinsurers. But this was not the case. It was a time of many unexpected upheavals and their expectations were time and again disappointed by quite some margin.

Not only did the link between economic growth and business development appear to have been broken, there were also an increasing number of areas in which the traditional statistical methods for calculating the probability and extent of future losses proved to be unreliable. In global aviation, there were new interactions between passengers, aircraft manufacturers, airport operators, air traffic control companies, and national and international regulators. These led to complexities in transport, accident, product, and liability legislation, on the ground and in the air, that were difficult to manage. 'Only time could tell whether present rates were adequate and it was thought more could be done by a careful wording of policies', were the remarks in a leading article in *The Review* in 1950. 'It was anticipated that a standard policy form would be evolved in the near future. The great difficulty was that underwriters were continually being asked to quote for new types of risks,

and that statistics, though serving a useful purpose, could not be the sole guiding principle.¹ The industry could not revert to mortality tables for passenger aircraft.

Reinsurers also had to fight their own uncertainties on other fronts. Wherever they looked, the world was changing and wherever they wanted to conclude treaties, their risk assessment let them down. The fast technological and scientific change and the rapid pace of economic growth led to new, long-term forms of risk which required new methods for calculating premiums and spreading risk. Experience with these new methods remained, however, still limited. The industry was becoming complex and confusing. The trend in technical results, that is, the ratio between premium income and cumulated losses, remained stubbornly negative. In these conditions, it was difficult to have positive expectations for the future, and strategic action was hard to justify. For those who nevertheless dared to try, reasons to believe in their assumptions kept disappearing. Essentially, it was more and more difficult to base expectations on past experience.²

1 MASS CONSUMPTION AND CRITICAL MASS

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The new risks facing the insurance industry in the post-war period were largely a result of radical technical change in the production of consumer goods and the development of infrastructure. Increasing consumer purchasing power meant mass demand for cars, domestic appliances, entertainment gadgets, synthetic clothing, and processed foods as well as for a growing number of new medicines. While everyday items were being produced more quickly and in greater quantities thanks to the rationalization of distribution (pallets, self-service stores, mail-order catalogues, and containers), synthetic materials brought down the cost of goods and automatization increased factory output.³ Lower prices for fossil fuels propelled a period of economic growth that was little short of a miracle, and not only in comparison with the suffering seen during the war.⁴

¹ *Review* 1950, 153. See also Ingram 1950; Bowden 1968.

² Hansson 1968. See also Koselleck, R. (1995), *Vergangene Zukunft: Zur Semantik geschichtlicher Zeiten* 3rd edn. Frankfurt: Suhrkamp.

³ Girschik, K. et al. (2003) *Der Migros-Kosmos. Zur Geschichte eines aussergewöhnlichen Schweizer Unternehmens*, Baden: hier + jetzt Verlag für Kultur und Geschichte; Tanner, J. (1994), 'Die Schweiz in den 1950er Jahren: Prozesse, Brüche, Widersprüche, Ungleichzeitigkeiten', in J.-D. Blanc and C. Luchsinger (eds.), *Achtung: die 50er Jahre! Annäherungen an eine widersprüchliche Zeit*. Zürich: Chronos, 19-50; Siegrist, H., Kaelble, H. and Kocka, J. (eds.) (1997), *Europäische Konsumgeschichte. Zur Gesellschafts- und Kulturgeschichte des Konsums (18. bis 20. Jahrhundert)*, Frankfurt/New York: Campus; Tanner, J. and Studer, B. (2012), 'Konsum und Distribution', in P. Halbeisen, M. Müller, and B. Veyrassat (eds.), *Wirtschaftsgeschichte der Schweiz im 20. Jahrhundert*. Basel: Schwabe, 637-702; König, W. (2000), 'Geschichte der Konsumgesellschaft', in *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte. Beihefte Vol. 154*. Stuttgart: Steiner; Hausteil, S. (2007), *Vom Mangel zum Massenkonsum. Deutschland, Frankreich und Grossbritannien im Vergleich 1945-1970*, Frankfurt: Campus.

⁴ Pfister, C. (1995), *Das 1950er Syndrom: Der Weg in die Konsumgesellschaft*, Bern/Stuttgart/Wien: Paul Haupt; Blanc, J. D. and Luchsinger, C. (eds.) (1994), *Achtung: die 50er Jahre! Annäherungen an eine widersprüchliche Zeit*, Zürich: Chronos.

The quantity and volume of industrial infrastructure and plants multiplied. The tanks, refineries and oil fields of the oil industry, the power stations, dams and distribution networks of the electricity industry, the airports, warehouses and shipping ports of the transport sector, all required specialized insurance cover. And, along with high-rise buildings, stadiums and tenement housing in expanding cities, were leading to increasing claims for compensation and growing interaction risks.

In the emerging mass consumption society, insurance played an important role. Along with the expansion of the social security system and its privately offered supplements, a mass insurance culture emerged. This provided security for collective, corporate, and individual investments in increased living standards and distributed the associated risks. Growth in the motor insurance sector, for example, was dramatic. In the US, premiums for car insurance rose from a total of USD 2.6 billion in 1950 to USD 14.6 billion in 1970.⁵ Motor insurance registered an increase in global premium volume of around one sixth in 1950 compared with over a fifth in 1979 and was thus proportionally one of the fastest growing branches of insurance. This was particularly on account of the proliferation in the largest markets of mandatory insurance for car owners in the 1960s.⁶ No other topic gained as much attention from direct insurers in the 1950s and 1960s as motorization. In particular, much effort went into classification, as inclusion and exclusion criteria needed to be developed for the various insurance strands. It was clear that business was booming and that there was massive scope for rationalization due to the unprecedented mass demand at least at national level.⁷

For reinsurers, however, this market was difficult. It was practically impossible to maintain an overview of all the international insurance models.⁸ As a whole, this line of insurance was characterized by falling profits from growing turnover.⁹ Looking at the liability side of motor insurance, personal injury claims were subject to ever-longer tails. Reinsurers had to absorb the expensive, long-term consequential costs of accidents and were active in a mass market in which their side of the business could not be rationalized,

⁵ Carter, S. B. (ed.) (2006), *Historical Statistics of the United States: Earliest Times to Present*, iv: *Economic Sectors*, Cambridge: Cambridge University Press, part 4, 834.

⁶ These figures were published in Swiss Re, *sigma* 7/8, 1981, 10. Only the insurance lines classified under 'other lines' (those lines with a small market share, including surety, credit, legal expenses, burglary, and engineering) registered a combined proportional growth that was greater than that of car insurance. Swiss Re, *sigma* 7/8, 1981, 11. The structural changes in the growth of insurance lines at global level mainly took place in the 1950s and 1960s, while the minor changes during the 1970s resulted from a consolidation of the global insurance premium structure. Swiss Re, *sigma* 7/8, 1981, 10. For the calculation of global premium volumes and the share by line of business, *sigma* drew on research carried out by insurance associations and supervisory authorities in individual countries as well as publications by international organizations. On account of unreliable data, the entire Eastern bloc was not included. Swiss Re, *sigma* 7/8, 1981, 2.

⁷ For an example of the many articles published by *The Review* on the problem of motor insurance in the post-war period, see *The Review* 1952, 319–20, 'The problem of motor insurance'; Astill 1959; Brown 1961. For a history of motorization in Europe, see Merki, C. M. (2002), *Der holprige Siegeszug des Automobils 1895–1930: Zur Motorisierung des Strassenverkehrs in Frankreich, Deutschland und der Schweiz*, Wien/Köln/Weimar: Böhlau.

⁸ Swiss Re made a desperate attempt in a series of tables in Swiss Re, *sigma* 6, 1968.

⁹ For example, car insurance in the US saw the share of paid claims in total premiums written increase from around 40 per cent in 1950 to over 76 per cent in 1970. Carter 2006, part 4, 834.

and which was subject to multiple unending special cases. There was an increase in the volume of traffic, made up of cars with stronger engines, driving in inadequate road conditions, at faster speeds, together with a boom in the construction of motorways. These conditions and the rise in compensation payments granted by the courts all contributed to making the motor insurance business a rather unattractive one for reinsurers.¹⁰ Inflationary pressures and the inadequate adjustment of tariffs, which were not able to keep up with the actual volume of claims owing to competition and government regulation, made life even more difficult for reinsurers.

As a general rule, reinsurance treaties for motor liability insurance combined a simple quota share treaty with a non-proportional model. There was no compelling reason from an actuarial perspective to conclude proportional treaties, as the risks taken on from direct insurers were numerous, homogeneous, and, relative to the premiums, reasonable. But direct insurers nevertheless sought to pass on part of the risk to reinsurers via proportional treaties. 'Therefore we may be induced to believe that the direct-writing companies were willing to cede a proportional part of the risks in order to share with the reinsurers the underwriting results and increase the competition with other companies', speculated the reinsurance specialist Stanislao Ternovec of Assicurazioni Generali in Trieste.¹¹

Perhaps this arrangement could still have been bearable from an underwriting perspective. It particularly cushioned somewhat the uncertainty of non-proportional treaties. But from the investment side, it was no longer working. As the market grew, technical reserves needed to be extremely high. Direct insurers could invest their reserves over the long term, while reinsurers could only invest their reserves over the short term, that is, under worse conditions, since reinsurance treaties could be terminated at any time. 'In other words, the financial profit could considerably improve the financial results of the motor business, but the reinsurer's profit is proportionally lower than that of the cedant.'¹² Therefore there was nothing else for reinsurers to do but seek their fortune in the mathematically challenging field of excess-of-loss treaties. Indeed, it was here that long liability processes with rising compensation amounts meant that clarity over how reinsurance business would actually progress was being postponed until further and further into the future. At the same time, unpredictable inflationary trends made calculating expected losses more difficult.

Although the car had become a well-established technology by the post-war period, its massive proliferation and the rapidly growing premium volume in the automotive sector presented the insurance industry with some fundamental problems. The issues were even greater in the areas, where there was a need to devise suitable insurance models for risks arising from completely new technologies. Nuclear power plants, jet-powered passenger aircraft, and new chemical and pharmaceutical products created a risk potential that was almost impossible to assess. There was simply a lack of reliable empirical data and sometimes even a failure to acknowledge the existence of the risks involved.¹³ In other words, this scientific and technological change and economic growth not only resulted in an

¹⁰ Ternovec 1958, 1366.

¹² Ternovec 1958, 1366.

¹¹ Ternovec 1958, 1366.

¹³ Swiss Re, *sigma* 3, 1972.

expansion of the business fields covered by the insurance industry, but also produced new latent dangers that were very time-consuming for insurance specialists to assess and often required many years of experience to accurately assess and convert into calculable risks.

As a result, reinsurers observed the carefree attitudes and uninterrupted technological euphoria of the post-war period with mixed feelings. The use of DDT against mosquitoes, cockchafers, and gypsy moths was either seen as a series of independent local campaigns that contributed to progress in general or was interpreted under the aegis of the WHO as supranational action of global social importance.¹⁴ Only with the publication of Rachel Carson's book *Silent Spring* did it come to be perceived as a problem by the general public. The causes of consequential damage arising from scientific and technological change often remained unclear for a long time. In 1958, the proliferation of malformations in newborns had initially been interpreted in the German Bundestag as a possible side effect of nuclear testing. The explosive question of who could be held liable for the enormous consequences of the drug Thalidomide, which had been prescribed as a treatment for pregnancy-related symptoms, was only settled in 1970. From a compensation perspective, this was after a legal case against the drug's manufacturer lasting almost ten years.¹⁵

There are plenty of other examples illustrating the extremely slow transition from an absolute faith in progress to a more cautious scepticism towards technology: from the interwar period until the introduction of special radiation protection legislation, nobody gave a thought to the fact that all good quality shoe shops possessed x-ray radioscopic devices, called pedoscopes, that showed the fit of any new footwear.¹⁶ In 1967, insurance experts were surprised by the consequential loss resulting from a major fire at the Vereinigte Draht- und Kabelwerke (United Wire and Cable Works) in the Berlin suburb of Neukölln, where 250 tonnes of PVC, paraffin, and polyethylene went up in flames. It was not the health risks from the resulting chlorine gas that caused concern, but the fact that this had led to serious corrosion damage to machinery in the factory located above the warehouse, doubling the amount of the indemnity payable and resulting in an increase in fire insurance premiums.¹⁷ The consequences of the introduction of highly toxic waste into lakes and rivers tended to be seen in the post-war period as an aesthetic problem,¹⁸

¹⁴ Kinkela, D. (2011), *DDT and the American Century: Global Health, Environmental Politics, and the Pesticide that Changed the World*, Chapel Hill: University of North Carolina Press.

¹⁵ Carson, R. (1962), *Silent Spring*, Boston/New York: Houghton Mifflin; Steinmetz, W. (2003), 'Ungewollte Politisierung durch die Medien? Die Contergan-Affaire', in B. Weisbrod (ed.), *Die Politik der Öffentlichkeit—die Öffentlichkeit der Politik. Politische Medialisierung in der Geschichte der Bundesrepublik*, Göttingen: Wallstein, 195–228.

¹⁶ Duffin, J. and Hayter, C. R. R. (2000), 'Baring the Sole: The rise and fall of the shoe-fitting fluoroscope', *Isis*, 91: 2, 260–82; Dommann, M. (2003), *Durchsicht, Einsicht, Vorsicht. Eine Geschichte der Röntgenstrahlen, 1896–1963*, Zürich: Chronos, 364–71.

¹⁷ Swiss Re, *sigma* 3, 1972; For the political history of plastic see Westermann, A. (2007), *Plastik und politische Kultur in Westdeutschland*, Zürich: Chronos. For the confrontations and mutual recriminations between the chemical industry and representatives of the insurance industry see 28–9.

¹⁸ Gugerli, D. (2000), '“Wir wollen nicht im Trüben fischen!” Gewässerschutz als Konvergenz von Bundespolitik, Expertenwissen und Sportfischerei (1950–72)', *Schweizer Ingenieur und Architekt*, 13: 31 March, 281–7.

whilst the health impact of the dioxin-containing defoliant used in the Vietnam War, Agent Orange, was simply brushed under the carpet for political reasons.¹⁹ And only in the late 1970s did it become beyond dispute that the insulating, heat and acid-resistant 'miracle' asbestos had unexpected health consequences which by now could be proven and which would result in enormous losses for the reinsurance industry.²⁰

Tolerance of the potential damage caused by new chemical and pharmaceutical substances declined so slowly in the post-war period. This is of significance to the history of insurance insofar as the latent and long-term dangers of scientific and technological change led to new difficulties and uncertainties when it came to calculating risk probabilities, particularly in the reinsurance industry. The sword of Damocles of legal liability meant that even the act of examining problems arising from technical change could be viewed as a criticism of industry, often resulting in delays in dealing with the underwriting aspects of those problems, while sometimes they were simply not addressed until a public scandal erupted.²¹

2 CRISIS OF ASSESSMENT

The most obvious example highlighting the assessment difficulties, the new scale of potential losses, and the long-term nature of risks in the post-war period was to be found in the case of nuclear energy. From the second half of the 1950s onwards, it was a problem that the insurance industry was forced to grapple with, after the Eisenhower administration's 'Atoms for Peace' programme led to a worldwide proliferation of nuclear power plants.²² Even then, reactor plants resembled a Pandora's Box and it was impossible to be sure how well they could be sealed off. The only thing that was clear was that effective participation in the debate about building, regulating, and insuring required a whole new vocabulary and an understanding of the interconnections between them. In a lengthy substantive article on the insurance industry, Roland H.

¹⁹ Young, A. L. (2009), *The History, Use, Disposition and Environmental Fate of Agent Orange*, New York: Springer.

²⁰ Binns 1982.

²¹ Manstein, B. (1966), 'Vom Terror der Technik' in K. Deschner (ed.), *Das Jahrhundert der Barbarei*. Munich: Kurt Desch, 438–94; Simon, C. (1997) 'DDT—Forschung und Entwicklung zwischen Chemie und Biologie', in T. Busset, A. Rosenbusch, and C. Simon (eds.), *Chemie in der Schweiz: Geschichte der Forschung und der Industrie*, Basel: Christoph Merian; Simon, C. (1999), *DDT: Kulturgeschichte einer chemischen Verbindung*, Basel: Christoph Merian. In the case of Agent Orange, it was the US Army veterans who raised the alarm about ecological concerns. See Orians, G. H., Pfeiffer, E. W. and Leuba, C. (1969), 'Defoliants: Orange, White, and Blue', *Science*, 165: 3892, 442–3; Orians, G. H. and Pfeiffer, E. W. (1970), 'Ecological Effects of the War in Vietnam', *Science*, 168: 3931, 544–54; Holden, C. (1979), 'Agent Orange Furor Continues to Build', *Science*, 205: 4408, 770–2.

²² Nehring, H. (2004), 'Cold War, Apocalypse and Peaceful Atoms: Interpretations of Nuclear Energy in the British and West German Anti-Nuclear Weapons Movements, 1955–1964', *Historical Social Research*, 28: 3, 150–70.

Lange of the Hartford Fire Insurance Company made the following comment about the insurance industry's entry into the atomic era: 'new and strange words have been added to the prosaic insurance vocabulary'.²³ The new age bred both optimism and concern at the same time. Although it was irrelevant to the fundamental differences of opinion regarding energy policy, discussions on the civil use of nuclear energy were always overshadowed by the military uses of nuclear fission in some way. 'Had the splitting of the atom been introduced first as a device for aiding and benefiting mankind, rather than as a threat to its obliteration, the fears which normally accompany thoughts of insuring such a destructive power would be greatly allayed,' Lange wrote in *The Review*.²⁴

The insurance industry was relatively quick to get to grips with the bomb itself, that is, the military technology that was responsible for maintaining the balance of terror. Unprecedented destruction would result from a third world war, which would certainly be a nuclear war and could break out at any time. The board of directors of Swiss Re even discussed the fundamental question of whether insurance still had any relevance when the 'use of nuclear physics for military purposes would usher in a total transformation in mankind's fundamental living conditions'.²⁵ However, as long as direct insurers refrained from insuring any war risks, they could be sure that 'the atomic bomb could only affect us in peacetime'.²⁶

The difficulties that the insurance industry faced in dealing with nuclear power plants were considerably greater. These difficulties started with the technical complexity of the reactor facilities, even before the implications of their possible failure, their risks, and thus their insurability were factored into the equation. 'Just what a nuclear reactor is and what it does is somewhat difficult to define in non-technical language.' Particularly confusing was the sheer variety of types of reactors. On top of this, it was almost impossible to assess their potential risk, because there was (almost) no experience of accidents to fall back on. What was known of an incident in an experimental reactor in the US state of Idaho only increased the confusion. While it had been possible to determine that the reactor was overheating in good time and the correct emergency procedures were adopted, the wrong button was pressed accidentally causing the reactor to shut down too slowly. Thus the question of the safety of the plant ultimately came down only to one of containment of the reactor shell.²⁷

Nuclear power plants represented a major challenge not only from a physical and technical viewpoint, but also from an actuarial perspective. It was difficult to divide the insurance requirements of such plants into risk types and types of insurance in the normal way. Nuclear power plants lacked the insurance industry's normal principle of containment. 'Normally, liability insurance is sold separately, and for separate limits, or amounts of insurance for bodily injury liability, which is applicable to persons, and for property damage liability' was what *The Review* had to say in regard to the business

²³ Lange 1956, 1071.

²⁴ Lange 1956, 1071.

²⁵ SRCA 10.107 770, BoD, 8 May 1954, 5.

²⁶ SRCA 10.107 770, BoD, 1 September 1953, 4.

²⁷ Lange 1956, 1072.

practices and rules that had pertained in the good old days.²⁸ Nuclear power plants put this in doubt, because it was no longer possible to issue liability policies neatly divided into casualty and property. Distinguishing between causes and consequential effects also presented problems and answering the question of who could be held liable for a reactor accident had become impossible. 'The catastrophic nature of these risks is further aggravated by the extent of the known and unknown accumulations that may occur in the case of an incident. A loss occurring at a reactor will affect the material damage liability insurer and the insurer, the accident insurer and the life assurer [*sic*]', was the explanation given in a 1964 Swiss Re anniversary lecture.²⁹

In the event of radiation damage arising from operations, it was to be expected that as well as the operating company, the general contractor, the participating construction companies, and the suppliers of components could also be held responsible, both for property damage and personal injury. This meant that the liability premiums for reactors had to be calculated separately for each plant, requiring an enormous amount of detailed work. The underwriters also needed to understand both the policy that they wanted to sell and what they were insuring to a degree that had not formerly been the case. 'Such determination will require consideration of a great deal of detailed information, such as the actual location of the reactor and its proximity to watersheds and areas of concentrated population; the type of reactor; the power level; the nature and extent of containment; and meteorological conditions normally prevailing in the area'.³⁰

Insuring nuclear power stations posed completely different problems to those that companies faced in their motor insurance business. The objects to be insured were extremely diverse, the number of plants was small and the potential losses were immense. In other words, nuclear power plants were extremely unwieldy, complex structures, for insurance experts as well as nuclear physicists, engineers, and politicians.³¹ Given the lack of experience regarding nuclear issues in the late 1950s, the insurance industry had to work intensively with experts to establish exactly what harmful consequences would occur in the event of the failure of each individual reactor or any of its components. They had to determine the risks that they should not insure in any event and those that were only viable for the largest possible pool of insurance companies.³² It soon became apparent that nuclear power plants were at the very limits of insurability. Given the enormity of the potential risks, this was of particular concern to reinsurers. 'Confronted with the very real danger of enormous cumulating risks, insurers have been obliged to forsake the classical method of coverage through the normal

²⁸ Charles J. Haugh, vice-president of 'The Travelers,' at a US nuclear energy forum in 1956, cited in Lange 1956, 1074.

²⁹ SRCA 10.112 188.01, Pierre Darioli, 'Reinsurance and the Peaceful Uses of Nuclear Energy', 100th anniversary lectures 1964, 2.

³⁰ Lange 1956, 1072.

³¹ Wildi, T. (2003), *Der Traum vom eigenen Reaktor: Die schweizerische Atomtechnologieentwicklung 1945-1969*, Zürich: Chronos; Kupper, P. (2003), *Atomenergie und gespaltene Gesellschaft: Die Geschichte des gescheiterten Projekts Kernkraftwerk Kaiseraugst*, Zürich: Chronos.

³² For coordination efforts undertaken in the first five years by the insurance industry to insure nuclear power plants, see Miles 1961.

channel of international reinsurance for the coverage of material damage to installations and the third-party liability for those same reactors,' *The Review* wrote following the 1958 Monte Carlo Rendezvous. 'In forming pools, who in fact assume to guarantee those risks, they have mobilized the full capacity of the respective national markets and have at the same time avoided clashing commitments.'³³ In the ultra-modern high-technology area of nuclear power plant insurance, where claims were a rare occurrence but were particularly large, professional reinsurers wanted to leave the business to pools and thus to the old co-insurance system.

3 LIMITS OF INSURABILITY

The problem of insuring nuclear power plants has never really been resolved. Nuclear power plants were probably the first large-scale systems of the industrial age where losses could soon reach a level that could only be borne by the state as the 'insurer of last resort'. The summarized statement that Swiss Re published on the occasion of its centenary on the topic of 'Nuclear, property, and liability insurance' reads almost like an admission of defeat. It was simply not possible to master the challenges posed by the risks from nuclear plants, nuclear fuel, and radioactive waste 'with normal insurance and international reinsurance methods'. To distribute the risks posed by nuclear power plants would require 'an organization that can mobilize the total capacity of both the national insurance and reinsurance markets and that allows the monitoring of the most important accumulations (insurance pools)'.³⁴

The crucial factor in determining the liability insurance of an owner of a nuclear plant 'whose principle risk initially seems uninsurable due to its catastrophe risk', was the assessment of the 'legal risk', that is, the maximum indemnity limit determined by the state. For this, one would either need to resort to the legally revolutionary innovation of 'exempting suppliers, transporters, and those involved in the construction, maintenance, and operation of the plant from liability' or adopt a global coverage instrument, in which all the participants would be covered against possible liability claims under an 'umbrella policy'.³⁵

Although the insurance industry was ultimately unable to fully resolve the issue of nuclear power plants, its involvement with the subject was not without consequences, particularly in terms of the institutional differentiation of the industry. Initially, however, other bodies took the lead at this stage. From the 1970s, the security problems of nuclear power plants began to be seen as a risk issue by the manufacturers' and energy authorities' engineers. To a degree, it was modelled with actuarial instruments in

³³ Tytens 1958, 1362.

³⁴ SRCA 10.112 188.01, '100 Years of Swiss Re.' Press conference of 29 February 1964, Problems of atomic, property and liability insurance, 1.

³⁵ SRCA 10.112 188.01, 3.

complex probability risk assessment studies. To enable a more accurate assessment of the potential dangers of nuclear power plants to be made, each subcomponent of a nuclear plant was assigned a failure probability. It was possible to derive information about the safety of the plant from the aggregate of these probabilities.³⁶

The outcome of every probability risk study was a quantifiable risk, rather than a guarantee of safety. It was thus apparent that the risks of nuclear power plants could no longer be managed by means of probability risk assessments. Instead, they had to be delegated to the analytical resources of sociology, which made the nuclear power plant catastrophes of the 1980s the focal point of what it named the risk society. The confusion emanating from Harrisburg and Chernobyl was treated by this branch of sociology as a mixture of risk assessment and technology assessment. But it took until the 1990s for this to filter upwards into sociological theory as 'risk socialization'.³⁷

4 CORPORATE STRATEGIES AND INDUSTRY INTEGRATION

The difficulties confronting the reinsurers in the post-war period were perceived as an expression of a structural crisis and addressed as such. From the mid 1960s, an increasing number of strategy documents recommended a root-and-branch strategic realignment to reconcile expectations and experience. Some began from the assumption that there was a 'structural crisis in non-life insurance' in general. Others even spoke of a particular 'international reinsurance crisis', distinguished by 'insufficiencies in brain-power and know-how to cope with the new situation'.³⁸

The reasons for reaching such a conclusion were varied. But it was clear that the industry found itself in a period of structural change and that the old rules needed to be re-thought. 'We must learn to live with continuous change', concluded Erik Bosshardt, Swiss Re's deputy director, at the Third International Insurance Seminar, held in London in 1967. He added that there was no option but to develop new mathematical methods and economic instruments to forecast business performance—'otherwise our existence might soon be at stake'.³⁹

What was at stake was more than the ritualistic reminiscences of a male-dominated world characterized by diplomatic finesse and sophisticated accounting, which supposedly concluded its reinsurance transactions in a fug of cigar smoke and cognac fumes in the salons of elegant international hotels and where the participants returned to their

³⁶ United States Nuclear Regulatory Commission 1975; Wynne, B. (1995), 'Technology Assessment and Reflexive Social Learning. Observations from the Risk Field', in A. Rip, T. J. Misa, and J. Schot (eds.), *Managing Technology in Society: The Approach of Constructive Technology Assessment*. London/New York: Pinter, 19-36; Carlisle 1997.

³⁷ Perrow 1984; Beck 1986; Luhmann 1993; Bonss 1995.

³⁸ Hansson 1968, 1140. ³⁹ Bosshardt 1967, 1049.

offices with outlines of treaties scribbled on napkins to be transcribed and formulated.⁴⁰ The problem of the 1960s had been the absence of forecasting skills, rather than the relative abstinence of inexperienced underwriters. The difficulties in forecasting meant that there was a risk of assessing risks too optimistically or pessimistically. In either of these cases, insurers and reinsurers would either drive themselves to bankruptcy or ruin their competitors. 'We no longer have time to wait for the statistics,' said Per M. Hansson, 1968 in Monte Carlo, adding that it would be more useful to look at the large losses that the coming ten years might bring rather than concentrating on the major disasters of the last hundred.⁴¹

Proposals to overcome the structural crisis in the reinsurance industry were manifold. They ranged from recommending organized contacts and agreements between reinsurers to a proposal for an industry-wide classification centre for excess-of-loss contracts, and an international information centre for reinsurance issues. It was also suggested that annual working conferences would produce more concrete results than could be obtained from the September Rendezvous in Monte Carlo.⁴² The steps actually taken by companies to overcome the structural crisis were no less diverse than the proposals. Although they were subject to the individual needs of each specific company, they increasingly influenced how the entire reinsurance industry was structurally organized.

By the first half of the 1960s, reinsurers were already fundamentally rethinking how their companies operated and restructuring their companies accordingly. There were, of course, very different answers to the question of how reinsurance business could be reflected organizationally in a company. One option, for example, was to break the business down by regions of the world in which the company operated. This meant having a department for the domestic market, a department for Europe, and a department for the US, Asia, and Latin America. Alternatively, a reinsurance company could also be arranged in terms of insurance lines, which would mean establishing sections for life, fire, liability, transport, motor, and every other line, to deal with each of these specialized lines individually. A third possibility was specialization by subject. Companies could set up a risk department staffed with mathematicians, a treaty department with lawyers, an accounting department with management specialists, and a consultation department with technicians. The larger a reinsurance company became and the more employees it needed to tackle the volume of business, the more critical became the question of how it should organize itself and how the departments should interact. In small companies, responsibilities such as these were not divided into separate personnel and administration functions, but major companies needed to establish separate departments that sometimes might have little knowledge of each other's activities. The problem was of critical importance, because functional differentiation led to new bottlenecks in internal communications, as each department had a particular competence and

⁴⁰ 'The reinsurance industry is unique among business ventures for its history of handshake agreements and contract terms written on the backs of cocktail napkins.' Schiffer 2006, 28.

⁴¹ Hansson 1968, 1141.

⁴² Hansson 1968, 1141-2.

seemingly needed to know relatively little about the problems and priorities of other departments. Additional organizational measures, such as regular market reports, needed to be adopted to overcome such differences of limited, specialized knowledge within the company. For although departments had their own responsibilities and rules, the company had to make sure that the specialists in motor vehicle insurance were able to communicate with the people responsible for the North American market, much as the life department needed to communicate with those with a sound knowledge of Asia.

As was the case with large industrial companies, reinsurance companies in the last thirty years of the twentieth century attempted to combine several organizational principles.⁴³ In 1964, Swiss Re introduced an additional hierarchical level, deputy directors general, and ensured that they had complementary skills profiles.⁴⁴ At the same time it improved its internal reporting and increased the flow of official information within the company. In doing so, it began to focus on systematically ensuring that the group's self-monitoring not only satisfied accounting criteria, but was also sound from a business perspective. 'True and fair' and 'transparency' became the new slogans by which the company oriented itself. This was important for the group structure, as it made it easier to identify the structural reasons for losses. The increased internal corporate transparency allowed units that had been loss-making for a significant period to be identified and, if necessary, disposed of, while thriving businesses were bolstered by new investments and acquisitions, such as direct insurance. As a result, the company's management was also better able to justify its strategic decisions. Corporate planning, participative management, and regular employee training were now also part of the range of in-house structural transparency. The cubiform organizational model adopted by Swiss Re in 1973 serves as an example of this. The model was adopted with the objective of facilitating greater 'integration of market- or product-related departments with the specialized departments.'⁴⁵ Simultaneously, Munich Re set about improving the organizational integration of the company by adopting a clear company-wide approach to electronic data management.⁴⁶

Corporate strategic measures regarding cooperation in the area of tariffs highlighted the potential of a fundamental reform of the sector but proved considerably more difficult. While the possibilities of cooperation were freely discussed at the 1968 meeting in Monte Carlo, attempts at self-regulation and coordination in the sector were convoluted. At Swiss Re's headquarters on Mythenquai in Zurich, the question of whether 'some degree of agreement could be reached on the issue of pricing abnormal risks' in the company's co-operative relationship with Munich Re had been broached rather indirectly as far back as 1962. The company was under no illusion, however, and the report on exploratory talks came to the conclusion that the suggestion was rather unlikely to succeed.

⁴³ Zimmermann, W. (1987), *Unternehmensentwicklung und Matrixorganisation*, Frankfurt/Bern: Lang; Harris, M. and Raviv, A. (2002), 'Organization Design', *Management Science*, 48: 7, 852-65.

⁴⁴ SRCA 10.107 772, BoD, 27 April 1964, 11-12.

⁴⁵ Swiss Re, Annual Report 1972/73, S. 4, quoted after Straumann 2013 in this volume.

⁴⁶ Leimbach, T. (2011), *Die Softwarebranche in Deutschland. Entwicklung eines Innovationssystems zwischen Forschung, Markt, Anwendung und Politik von 1950 bis heute*, Stuttgart: Fraunhofer, 245.

But the competitor did not even want to cooperate in the treatment of high blood pressure and obesity, risks which were becoming more common in the post-war period.⁴⁷ It was, however, not the adherence to the principles of a free market which prevented such a cooperation. Rather simply, the failure was due to the fact that Munich Re was already in possession of Swiss Re's rating manual. In tariff matters the industry was already more interlinked than it had thought and any further cooperation was deemed counterproductive.⁴⁸

With competition growing towards the end of the 1960s a more offensive attempt at commonly adapting tariffs was considered in order to create the basis for better cooperation between reinsurers. The German cartel regulation, for example, had granted the direct insurers a 'block exemption' which allowed them to coordinate minimal tariffs. This by definition would also include reinsurance. In any case, top-level discussions were held in 1967 about Swiss Re's suggestion to 'create a neutral tariff office for industrial risks that would be binding on insurers' or alternatively the 'exclusion of major risks from obligatory treaties and establishment of adequate minimum premiums for certain risk classes such as plastics, and so forth'.⁴⁹

In June 1969, Swiss Re and Munich Re representatives met in Munich to discuss the coordination of premiums, risk inspection, and loss regulation. Premium additions to large risks such as engineering, earthquakes, and flooding were discussed with a view to making these insurable. The discussion note highlights the difficulties in dealing with a loss of control vis-à-vis the direct insurers in such matters and the way to treat such issues in order to improve the position with clients. Premium calculations should be chosen individually in each company in order to still arrive at comparable results. It was desirable that each company should provide a 'different but equally viable calculation of tariffs'. It was agreed that 'coordination of contractual matters was inevitable. As far as tariff calculation, inspection of risks and technical advice with loss adjustment were concerned, a possible cooperation was considered' to avoid costly duplication of effort. The usual procedure of lead reinsurers assessing the risks and calculating the premium would thus have been formalized and could be adopted by follow reinsurers. Such tariffs were presented to regulatory bodies in the respective markets for approval.⁵⁰

The initiative towards increased cooperation and coordination is in line with existing practice. Reinsurers were aiming to reduce cost-intensive and destructive competition and increase industry-wide integration to be better equipped to deal with the stronger position of direct insurers. Swiss Re and Munich Re confirmed their intention to form commissions and arrange regular meetings. Yet, it was clear to all those involved that it was not easy to develop tariffification guidelines which could be adapted to rising interest rates or country- and market-specific circumstances. The discussions in Munich mainly demonstrated how complex risks, which were at the heart of the discussions, were laden with complicated details which eventually made finding a solution far more difficult.

⁴⁷ SRCA 10.160.823.01, E. Tanner, 'Besprechungsnotiz "Münchener Rück"', 19 June 1962, 1-2.

⁴⁸ SRCA 10.160.823.01, 3.

⁴⁹ SRCA 10.160 823.01, letter of M. Eisenring to A. Alzheimer with copy to Prof. Pröls, 14 July 1969.

⁵⁰ SRCA 10.160 823.01, H. R. Kaufmann, Besprechungsnotiz 'Münchener Rück', 17 July 1969, 2.

It was an easy thing to talk about finding similar assessment methods and to hope for a better cooperation within the industry but, eventually, there were ample reasons for continuing with differing tariff strategies. For instance, it would certainly have been possible to apply the pricing rules of the London market to risk coverage in plant construction. But with regard to reinsurance of major engineering projects for which the large-scale instruments 'Erection All Risks Insurance' (EAR) and 'Contractors' All Risks Insurance' (CAR) had been developed and were frequently offered together in combined policies, it was easy to arrive at different assessments, and therefore different contracts had to be drawn up.⁵¹

5 INFRASTRUCTURE OF KNOWLEDGE

From a long-term perspective, neither the internal reorganization measures nor the attempts to cooperate on tariffs were likely to have been the key factors in overcoming the structural problems in the reinsurance industry. More important were the industry's responses to the challenges of the structural crisis, which made it possible for the industry to resolve actuarial problems in an analytically sound manner. Only readily available expertise could be of help when, for example, it came to difficult matters such as the adequacy of reserves and interest rates in tackling the 'incurred but not reported' (IBNR) problem under excess-of-loss treaties.⁵² This implied the difficult question of how to deal with losses that developed into claims only many years later and whose magnitude could not under any circumstances have been predicted by the reinsurer. Direct insurers could only inform reinsurers of their anticipated losses. This much was clear to reinsurers. However, as Julius Neave said in Monte Carlo in 1968, direct insurers often had too little in the way of IBNR reserves, that is, their reserves were insufficient to meet losses that had already occurred, which represented 'a means of camouflaging results in renewal negotiations, to the prejudice of the reinsurer'.⁵³ This was another area where reinsurers were unable to obtain a direct insight into the daily business of the direct insurers. To gather reliable information about direct insurers' actual claims experience and devise a way to assess the calculation principles of their businesses, reinsurers were compelled to resort to other means.

The prolonged inflation of the post-war period also had an enormous impact on reinsurers, as inflation in non-proportional reinsurance treaties had a non-proportional impact on the reinsurance business.⁵⁴ Inflation weakened the reinsurance industry in two ways: firstly, there were delays in the settlement of claims as a result of complex legal

⁵¹ *The Review* 1961, 708-11 and 713.

⁵² The problem of IBNR, i.e. the question of forming suitable reserves for damages which have already been incurred but not yet been reported, would still be the theme of academic dissertations more than thirty years later. See Severin 2002.

⁵³ Neave 1980, 10.

⁵⁴ Swiss Re, *sigma* 7, 1970; *The Review* 1968, 5-7; Boss 1969.

proceedings surrounding large liability cases; secondly, the transmission mechanism was probably of even greater significance: in non-proportional reinsurance treaties the reinsurer assumed all losses above a certain retention on the part of the direct insurer in return for a fixed reinsurance premium. Inflation thus increased the proportion of losses that the reinsurer had to assume in its layers. This was because direct insurers only needed to increase their premiums and excess by the rate of inflation to protect themselves against inflation-induced losses, while reinsurers suffered the knock-on effects of an increased aggregate excess volume. Inflation pushed some of the cases previously retained by the cedent into the excess layers, that is, to the areas beyond the previously applicable excess point. The increase in losses meant that the reinsurers had to pay out on a larger proportion. And this meant that simply increasing the reinsurance premiums by the percentage rate of inflation was not enough—a problem that would have been only partly resolved by the development of stability clauses.⁵⁵

This view seems to have been more common among US reinsurers, due to their more extensive experience of excess-of-loss treaties and the fact that they had been faced with the effects of rising direct insurance premiums on the reinsurance business during the period of inflation resulting from the Korean War.⁵⁶ European reinsurers, on the other hand, only towards the end of the 1960s began to realize that the rate of inflation had a disproportionate impact on the reinsurance business.

As the impact of inflation was significantly higher on reinsurers than direct insurers, reinsurers had a strong motive for keeping a close watch on how the market developed and the impact of contract models that were intended to counteract the effects of inflationary developments.⁵⁷ They also had a powerful motive for monitoring the market more thoroughly and expanding their knowledge of the insurance business, because while false assumptions took a long time to impact on the reinsurance business, when they did, they had an enormous impact. This was vital for the development of the industry: unrealistic ratings could have ruined precisely those reinsurers who were able to do their sums correctly, but whose realistic premiums were more expensive than those offered by their competitors and would therefore fail to attract any treaties. Price wars between reinsurers were ruinous for structural reasons and it was only the market's continued strong expansion that averted disaster.

However a reinsurer assessed the two wild cards in their equations, IBNR and inflation, it was imperative that a successful business had a precise understanding of their effects and consciously took them into account or decided to ignore them when calculating tariffs. The IBNR reserve and the effects of inflation were only two of many examples where, by the end of the 1960s, the available technical knowledge was being pushed to its limits. This lack of knowledge was also an industry problem. It affected not only the evaluation of individual reinsurance contracts, but also impacted on that of companies

⁵⁵ *The Review* 1968, 5–7. As late as 1970, *The Review* remained sceptical about the possibility of using a stability clause in excess-of-loss treaties. See Cockerell 1970.

⁵⁶ *The Review* 1968, 5–7. ⁵⁷ A good illustration is provided by *The Review* 1968, 5–7.

as a whole. Given the increasing density of cross shareholdings, such assessment difficulties were immensely important to the entire industry. Systematic evaluation errors could also have serious consequences for a company's business if they happened to be in the treaties of a potential partner.

Hence it was imperative to tackle the structural evaluation problems in the reinsurance industry by means of industry-level structure-building measures. A succession of new institutions were set up in the last thirty years of the twentieth century to increase the availability of technical, economic, and political knowledge relevant to underwriting in the reinsurance industry. Had these measures been less diverse, it might have been possible to speak of a targeted development of a sector-specific infrastructure of knowledge.

For the first time in the long history of reinsurance, an independent monthly magazine devoted exclusively to special issues concerning international reinsurance appeared in May 1969. The editor of *Reinsurance* justified the need for such a publication on the grounds of the structural problems affecting the entire insurance industry, whose consequences had a particularly powerful effect on the reinsurance industry. The editorial introduction in the first issue stated: 'Inflation, rising fire wastage, elemental losses on an unprecedented scale, and increasing third-party awards have caused many direct-writing companies to show overall technical deficits for the first time for many years. The inherent nature of the reinsurance business has magnified the impact of these developments on reinsurance.'⁵⁸ Even the contents page read like a catalogue of the problems confronting the reinsurance industry. As well as book reviews, market reports, and one article each on the great characters and principles of the reinsurance industry, the magazine offered readers articles about transport insurance in the age of jumbo jets and supersonic aircraft, and several articles explaining the problems arising from the excess-of-loss method.

The first issue of *Reinsurance* also reported on the inauguration of the Reinsurance Offices Association, which had taken place in March 1969. It stated that the industry was clearly aiming to increase cross-company technical cooperation and that the association offered its services to all reinsurers, including those in continental Europe. As the magazine stressed, this was not about drawing up binding recommendations for its membership, as a standard tariff would not be enforceable in the reinsurance market: where direct insurers' agents, countless brokers, intermediaries and representatives of professional reinsurance companies, each with different instructions, were in direct competition for business, standardizing rates would clearly be impossible—'such objectives would be undesirable and impracticable and, indeed, the very international character of the business would render them virtually impossible'. Nevertheless, it added, it would be useful to have a better knowledge of the mechanisms of this complex market.⁵⁹ That is why the association would focus on organizing expertise in committees and working groups devoted to technical issues relating to reinsurance, and why it would formalize the somewhat relaxed discussions at the Monte Carlo meetings into a

⁵⁸ Nelson-Smith 1969.

⁵⁹ Neave 1969b, 8.

form that was applicable across the industry and markets. 'Here, therefore, is in existence an additional means for the spread of reinsurance thinking and experience between the markets.'⁶⁰

The model for such a think tank was undoubtedly the venerable *Insurance Institute of London* (IIL), which was founded in 1907 by direct insurers and whose study groups had been publishing technical reports since the late 1940s. The recently completed ten-year IIL study on the problems of excess-of-loss methods, *Advanced Study Group No. 148* (ASG), was critically reviewed in the first issue of *Reinsurance*. This helps understand reinsurers' efforts to establish such study groups themselves. The review began by paying tribute to the work of ASG 148, stating that those who accused the working group of being 'a coterie of academics' occupied with irrelevant issues were completely mistaken. All the members of the group were experienced practitioners, 'ranging from brokers on the one hand to specialist reinsurers on the other' and came from very different branches of the insurance business. The report, 'which has its roots firmly entrenched in practical aspects rather than in theoretical views', was therefore entirely based on reality, it stated.⁶¹

The reinsurers were clear that the technical problems needed to be examined carefully, which meant that the process had to remain both practical and objective. Moreover, *Reinsurance* subscribers should see for themselves to what extent the views of the IIL represented the one-sided perspective of the direct insurers and thus justified the establishment of reinsurance-specific working groups. The magazine's editor praised the care with which the IIL report had been elaborated and left it to the reinsurance manager Julius Neave to write a sympathetic, if critical review of the report. Neave agreed that the *Advanced Study Group* had covered the issues relating to excess-of-loss treaties thoroughly, but added that the group had not investigated the matter in enough depth to adequately address the problems faced by reinsurers.

For example, practice had shown time and again that direct insurers were incapable of resisting the temptation to violate the rules of sound calculation the moment they entered into a reinsurance treaty. There were even shortcomings in their handling of large claims or in the flow of information between direct insurers and reinsurers. In addition, the study group would necessarily have to deal with the calculation of excess-of-loss rates and the long-tail issue, applying new statistical methods and using a computer, that is, against a background where liability cases involving individuals could face years of delays waiting for a court decision on final compensation. And finally, it was not clear exactly what should be described as a catastrophe, because 'the frequency with which catastrophes take place in the world today is such as makes one wonder whether we should not change our definitions and find another word for catastrophes, which have become so commonplace that there are literally scores of them each year.'⁶²

The reinsurers of the late 1960s believed that cross-company study committees, whose deliberations were made available to the industry as a whole, would be an attractive

⁶⁰ Neave 1969b, 9.

⁶¹ Advanced Study Group No. 148, 1969, 34.

⁶² Neave 1969a, 35–6.

approach to solving its problems. Swiss Re made a start by opening up its internal reporting to the industry. Information that had previously only been circulated among the company's own senior management circles and specialists was now published in a format that was universally-oriented, if somewhat academic. For instance, Swiss Re's Economics Department had been producing internal summaries and reports on important articles on insurance and the economy for some decades⁶³ and now made these available to the entire reinsurance industry. From January 1968 on they were published in a company magazine called *sigma*.⁶⁴

Even the appearance of the themed issues of *sigma* was remarkable. While Swiss Re had abandoned nineteenth-century printing and design styles in its annual reports, and from 1973 had switched to a high-gloss format with explanatory graphics and illustrative photographs, a different approach that reinforced the seriousness of the subject matter was selected for *sigma*. The appearance of the reports was kept deliberately simple. The xerographic typescripts of the *sigma* magazines emphasized the primacy of content over form, clearly reflecting the desire to publish problem-oriented analyses based entirely on cited source material or even simply reproduced collections of data in table formats. Professional studies of the long-term structural changes in the markets were to be made available to the industry directly from ongoing operations, as quickly as possible. 'Reproduction in whole or in part permitted with indication "sigma, Swiss Reinsurance Company"' was the statement in the footer of the earliest surviving copy, dated February 1968, which addressed the alarming problems facing international marine insurance. Quoting the development of the global scale of ocean freight volumes and changes in the units, tonnage, and size structure of the global merchant fleet from 1954 to 1966, the intention was to explain the 'trend reversal in claims experience resulting from the structural changes in the global merchant fleet'.⁶⁵

Right from the outset, *sigma* covered a remarkable variety of subjects and diagnostic expertise. While some topics were discussed several times over the years in order to remain up to date and make valid forecasts, each issue of *sigma* was devoted to an individual problem—from the 'Défi Américain' ('The American Challenge'), about the difficulties in 'constructing integrated economic areas' to the 'long-term growth of insurance and the economy as a whole'. Other issues read more like collections of documentation such as the 'Development of Global Premium Volume 1955–1966 by Continent and Industry', the 'Catastrophe Losses of 1969', or the 'Shift in the Insurance Structure of Fourteen Countries from 1951–1965/65'.⁶⁶ *sigma* did not therefore restrict itself to highlighting reinsurance buzzwords, such as 'change', 'forecasting', 'structure', 'development', or 'growth'. Swiss Re's technical and economic publication also maintained a rather

⁶³ 1960–1965, 'Information—Department of Economics' (IVA); 1966–1968, 'Information—Department of Economics' (IWA).

⁶⁴ Information according to Swiss Re corporate history. See also the IVA/IWA/*sigma* collection at the Swiss Re Library in Zurich: ZRH Z 0282.

⁶⁵ Swiss Re, *sigma* 2, 1968, 'Problems of International Marine Insurance'.

⁶⁶ Swiss Re, *sigma* 5, 1968; Swiss Re, *sigma* 11, 1969; Swiss Re, *sigma* 10, 1968; Swiss Re, *sigma* 6, 1969; Swiss Re, *sigma* 1, 1970; Swiss Re, *sigma* 7, 1968.

academic style of elaboration, restraint, cautious appraisal, and rational debate that went far beyond the specific business goals of its own company.

It was a style that was adopted on a larger scale in Geneva a few years later, when the *International Association for the Study of Insurance Economics* began its work in 1973. The association had been set up with the intention of addressing the problems of the insurance industry by publishing studies with an economic slant. Mannheimer Versicherung, Royale Belge, Allianz, Generali, and Paternelle, who met in Paris in 1971 for a preparatory meeting in advance of the establishment of the association, took the initiative. The inaugural meeting, in February 1973, was again held in Paris, where Raymond Barre, later to become prime minister of France, was elected as its chairman. Under the aegis of the insurance industry's most powerful players—the members of the association were the leaders of more than 90 global insurers and reinsurers—the association devised a differentiated research agenda in Geneva. Within easy striking distance of London, Munich, Paris, Zurich, and New York, and to a degree independent of company interests, it was an international platform that became a virtual centre for insurance economics research. Such an institutional and organizational structure, designed to generate international knowledge about the insurance industry, was obviously a significant step beyond what any individual company or sector and their working groups had ever been able to achieve.

The Geneva association's research programmes must be seen as a response to the structural problems of the insurance industry in the 1970s. The association also aimed to study 'long-term problems' resulting from the seemingly inevitable increase in insured losses across a wide variety of fields.⁶⁷ Unlike the *Insurance Institute of London* or the *Reinsurance Offices Association*, however, the new body established a clear division of labour between professionals, organizers, and academics. The members of the association were responsible for the programmes and topics, while the academics devoted themselves to the economic aspects of insurance. The office ensured that the results were disseminated to the industry through its own risk management publications and by organizing conferences, panels of experts and programmes. Initially these dealt with the economic aspects of insurance, but from 1985 onwards with the relationship between law and insurance too. Only a small proportion of the research was carried out in house, the majority was outsourced to academic institutions. When the association was first founded, Swiss Re's board of directors were of the opinion that the task of its head was 'to gather facts and documentation within existing organizations (such as the OECD or the CEA), while the ensuing research should be delegated on a case-by-case basis to the

⁶⁷ Swiss Re's board also referred to the newly founded Association in 1973 under the heading 'Future Problems of the Insurance Industry'. The board wanted to draw attention to the 'problem of increasing environmental damage', an issue which was also addressed by *sigma*. 'A sharp increase in insured losses seems inevitable in various areas and the question is how this development can be countered in a timely manner (e.g. including the best possible estimates or measures of the anticipated losses).' Faced with these challenges, the Association declared its intention to deal primarily with the 'long-term problems' faced by the insurance industry, as Heinz Vischer, a Swiss Re board member and member of the Association, explained, SRCA 10.107 774, BoD, 14 March 1973, 19.

University of St Gallen or other Swiss or European universities.'⁶⁸ In this way, the Geneva association intensified the cooperation between university research and business practice. This mirrored developments in the pharmaceutical industry, which was establishing platforms for biotechnological knowledge at the same time, and the information technology industry, which expanded its scientific knowledge base through its own academic research institutions.⁶⁹

The Geneva association had a large variety of insurance economic publications that dealt with the structural problems of the insurance industry in a scientific way. These included the *Geneva Papers on Risk and Insurance*, the *Geneva Papers on Risk and Insurance Theory* and the reports known as *The Geneva Reports*, but there were also newsletters, *Etudes et dossiers*, working papers from conferences and workshops as well as monographs and anthologies that, according to Raymond Barre, were intended to contribute to strategy development and decision-making in the insurance industry.⁷⁰

While the activities of the Geneva association were productive and had come at the right time, they were not focused on the handling of reinsurance issues. Reinsurers were indeed involved in the association, but only as partners of the direct insurers. The association's main focus was on general problems relating to insurance economics, with reinsurance of secondary importance. This was already evident from the first *Geneva Paper on Risk and Insurance*, in which a mathematician and an economist discussed the microeconomic modelling of motor vehicle liability insurance under inflationary macroeconomic conditions, with the word 'reinsurance' appearing only once in a footnote.⁷¹ They therefore pushed proprietary insurance industry studies such as *sigma* and focused on topics that better illustrated their difficulties.

Natural catastrophes were an issue suited to this. Natural catastrophes remain the unique hard-to-predict major risk. While their probability of occurrence in a given location is very low, they have enormous consequences for those affected. From the early 1970s onwards, reinsurers began to systematically address natural disasters and their repercussions.

Both the debate on natural catastrophes initiated by the reinsurers and the fact that they provided the industry with technical studies that were relevant to the insurance industry as a whole made a significant contribution to the development of an industry-specific knowledge infrastructure. From a corporate strategy perspective, both strategies may be understood as components of the large reinsurance companies' emergent

⁶⁸ SRCA 10.107 774, BoD, 14 March 1973, 19–20.

⁶⁹ Bürgi, M. (2005), 'Pharma, Politik und Polypeptide. Die Institutionalisierung der Molekularbiologie in Zürich, 1962–1971', *Traverse. Zeitschrift für Geschichte*, 3, 126–39; Bürgi, M. (2011), *Pharmaforschung im 20. Jahrhundert: Arbeit an der Grenze zwischen Hochschule und Industrie*, Zürich: Chronos. In the late 1960s, Ciba and Roche broke down the institutional barriers between industry and academia in the field of biology. They established research institutes in which they also nurtured their own young talent and their research staff even took on teaching roles at universities, see Bürgi 2011, 137–64. For information on the IBM research centres in New York, San Jose, and Zurich see: Bashe, C. J. et al. (1986), *IBM's Early Computers*, 2nd edn., Cambridge, MA: MIT Press, 523–70.

⁷⁰ Barre 1976.

⁷¹ Belloy and Gabus 1976.

signalling technique: producing market studies was both costly and time consuming. If a company was going to make the results of studies freely available to its competitors and customers, they had to have a positive effect on that company's reputation. Such efforts were designed to persuade potential customers and competitors that they were dealing with a reputable company. As they were often also partners when it came to large treaties, this also served to illustrate that they could afford to disclose the professional skills involved in their business activities to the industry as a whole. By publishing their own magazines, with assessments that could stand up to critical review, large reinsurers were showing their integrity and reliability to the specialized markets. Since it was difficult for direct insurers to assess reinsurers' actual capabilities, such indirect assessment tools were warmly welcomed. Indicators like this boosted confidence even though the essentially asymmetrical relationship in communications between direct insurers and reinsurers and the impossibility of evaluating the estimates and capabilities of possible contractual partners remained a fact. The introduction of such indicators contributed to the stabilization of industry-specific fundamental assumptions and norms of behaviour.⁷²

Also, the reinsurers' debate on natural catastrophes helped build confidence. Given the fact that people in the early 1970s still liked to imagine that the world was controllable, it was somewhat risky to specialize in phenomena where there was little to control or decide and not much was calculable. Despite extensive seismological research programmes, nobody could really predict when an earthquake would strike, and attempts by atmospheric physicists to predict the development of hurricanes had been plagued by failure. It was, however, precisely the fact that natural catastrophes represented a threefold frontier, being virtually not insurable, predictable, or controllable that made them an attractive focus for the new debate on reinsurance. The reason was that natural catastrophes had a particular geographical universality and therefore a certain general applicability. No one knew where and when they would occur. Yet it was clear that they would strike somewhere in the world—maybe even with increasing frequency—but in any event they were becoming ever more relevant to the insurance industry.⁷³ Natural catastrophes also reflected the global increase in insurance coverage and generally led to insurance supplies being adjusted.⁷⁴ Direct insurers who had miscalculated and whose reserves had been too low or who had not concluded sufficient reinsurance soon vanished from the scene after a storm or an earthquake. Reinsurers who miscalculated could equally well be destroyed by a hurricane like Betsy, which devastated whole tracts of Florida in 1965.⁷⁵

This helps us to understand why expertise regarding natural catastrophes was instrumental for reinsurers and redefined their relevance in the insurance world. No direct insurer

⁷² The signalling concept was first introduced in 1973 by Michael Spence for the labour market and was then applied to other markets. See Spence, M. (1973), 'Job Market Signaling', *The Quarterly Journal of Economics*, 87: 3, 355–74. For the importance of signalling for social norms, see Diekmann, A. and Przepjorka, W. (2010), 'Soziale Normen als Signale. Der Beitrag der Signaling-Theorie', *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, Sonderheft, 220–37.

⁷³ For further information, see Werner 2014.

⁷⁴ For example, this argument is put forward by Lawless 2005.

⁷⁵ 'Arbee' 1966; Alzheimer 1968; Daenzer 1968.

could claim to have put as much effort into understanding the consequences and treatment of natural catastrophes as the reinsurers. By taking responsibility for addressing the natural catastrophe issue, reinsurers managed to frame a debate far beyond the confines of the insurance industry. With their global perspective, they were in a position to calculate the likely losses and possibly come up with reliable information about the latent regularity of natural catastrophes.

Reinsurers and their authority in natural catastrophes were addressing the outer limits of insurability and were therefore best placed to comment on these limits. 'This limit of insurability is also noticeable in natural catastrophes. Flood catastrophes, for instance, are practically uninsurable, however shrewd the insurance system that may be worked out, since the measure of catastrophe cannot be estimated and is not in line with the law of averages. To a certain extent, the same can be said for earthquake and other natural losses, riots, and/or political risks,' Alois Alzheimer, director general of the Munich Re Group, stated in 1968. Some major risks could only be covered at a global level: 'only the balance of the world-wide reinsurance facilities managed to carry the largest overall insurance loss yet, amounting to approximately USD 715,000,000 resulting from hurricane "Betsy" in September 1965 in the USA, without disturbing the effectiveness of the world insurance industry'.⁷⁶

From an insurance economics perspective, it was first and foremost the heavyweights among the international reinsurers who were responsible for the problem of insuring the uninsurable, something that the debate on natural catastrophes had alluded to.⁷⁷ In their corporate magazines, in the newly founded *Reinsurance* magazine, and as guest writers in the insurance periodicals, they repeatedly brought attention to the relevance of the topic, by means of maps and tables about loss amounts and casualties. Many of the articles originally published in the reinsurance industry's own publications found their way into the direct insurers' magazines and ended up being published, or at least discussed, in *The Review*.⁷⁸

In 1978, *sigma* established an overview of claims between 1968 and 1977 and concluded that natural catastrophes accounted for over a quarter of recorded global catastrophes and that they occurred 'each year with alarming regularity and only slight variations'.⁷⁹ The authors of the study also suggested that the observed regularity of natural disasters meant that a certain degree of predictability was possible with catastrophes.

Just two years later, it was followed by another *sigma* study investigating loss severity trends in weather-related natural catastrophes. Using wind storm insurance in the Federal Republic of Germany in the 1950s to the 1970s as an example, *sigma* attempted to show 'that there is an unmistakable cycle in the recurrence of years with heavy losses.... Strong spikes in losses thus appear to occur with a certain regularity. Nevertheless, it is impossible to predict with certainty whether a catastrophic year is imminent'.⁸⁰

⁷⁶ Alzheimer 1968, 994. See also Gollier 1997.

⁷⁷ *The Review* 1979, 31.

⁷⁸ Swiss Re, *sigma* 1, 1970; *The Review* 1975, 252; *The Review* 1976, 35.

⁷⁹ Swiss Re, *sigma* 7, 1978, 4.

⁸⁰ Swiss Re, *sigma* 6, 1980, 6.

6 INTEGRATING ACADEMIC WORK

Even in its infancy, reinsurance was a business requiring extensive knowledge and never offering a guarantee—no matter how much care was taken—as to which assumptions concerning any given case were accurate and which ones would prove wrong. Each and every reinsurance agreement brought along a good dose of uncertainty with it that only the passage of time or additional knowledge managed to transform into certainty. Even worse, the more sophisticated the calculations and the more differentiated the agreements became, the more ‘uncertain’ the old calculations. Reinsurers had to assume that the old models were riskier than the new ones. But in some cases the old, simpler methods proved sensible and economically viable over time after all. Were the new agreements perhaps a bit too sophisticated and the good old days indeed as good as they were perceived to be? Reinsurers could never really rest assured of their future’s safety, yet still had to provide the last level of insurance before the state as the ‘insurer of last resort’. All they could do was bundle expertise together from as wide a spectrum as possible, develop stable methods of assessing their business, and hope to keep all the relevant details in mind and avoid accepting any risks that would reinforce instead of offsetting each other.

This explains why the history of professional reinsurance is not just one of the market’s growing complexity, but also of the increasing systematization and safeguarding of decision-making processes. This is not to say that it was somehow easier to underwrite risks ‘back then’. But in the nineteenth century, decisions managed to get approved as being solid with justifications less sophisticated than those necessary in the last thirty years of the twentieth century, regardless of whether they actually turned out to be especially clever or indeed disastrous.

The business’s legal, actuarial, and economic assessments, as they found their way into the various forms of legal agreements, calculation models, and investment strategies, have seen enormous growth once again since the late 1960s. This includes their complexity, sophistication, and the extent of the professional demands placed on them. The specialized knowledge of a range of experts had to be combined so that these challenges could be tackled. As explained in 1981 to *sigma* readers, the reinsurance business needed a ‘modern management style’ to do so, one that could enable ‘the skills of specialists of various disciplines (engineers, actuaries, legal experts, etc.) to be applied in a meaningful manner.’⁸¹

The volume of reinsurance cover for large risks, namely infrastructure such as airports, oil platforms, and dams, surpassed that of previous agreements many times over. Yet just the assessment of such projects was becoming an extremely demanding task, and the associated issues could not be addressed with one-size-fits-all solutions. Each

⁸¹ Diehl 1981, 4.

project had its own unique design and underlying conditions, and had to be analysed from scratch unless the reinsurer decided to simply have someone else do the risk assessment.

This prompted reinsurers to start hiring engineers in the 1970s, who were able to evaluate projects and inspect facilities ready to start operations and their insurability. In doing so, they had to deal with complex multilevel considerations. Their job included assessments of how well the direct insurers covering the risks had assessed the work of the civil engineers of the cellars and buildings themselves, structural engineers, construction logistics specialists, geologists, power plant builders, and other specialists.⁸² Reinsurance was developing into a business from which solidly structured and sustainable business models had to be derived from the diagnostic diversity of the experts and the actuarial simulations. This kind of work could not be done without engineers.

The share of reinsurance groups’ staff with training in the natural sciences also increased significantly during the last thirty years of the twentieth century. This trend was observed very closely in the human resources statistics, and was justified from time to time in the comments issued on HR developments. Apart from the chemical, biological, and physical implications of industrial processes, growing environmental problems had to be dealt with for underwriting purposes and reinsurers needed natural scientists for this. Yet there were hardly any empirical data available in this area. Environmental problems had to first be scientifically understood before they could be transformed into insurable risks. So direct insurers and reinsurers also had to mobilize any and all knowledge in this field that they did not yet have in-house. The trend of academic staffing levels at Swiss Re is representative for the entire sector in this regard. In 1970, 16.8 per cent of Swiss Re’s employees working at its head office in Zurich were academics, of which none were engineers. Although the percentage of academics in its overall workforce grew only slightly, reaching 17.8 per cent by 1982, by that time one in ten of the academics employed had studied engineering.⁸³

In 1974, Swiss Re announced that it had made a joint attempt with H. Clarkson (Overseas) Ltd, Incorporated Insurance Brokers in London, to create a way to provide insurance cover for damage to the environment, based on scientific assessment. In light of the lack of experience with such risks, underwriting and pricing on the basis of statistics

⁸² One example of the efforts to train engineers on insurance topics is the publication SRCA 10.119 407.00.029, ‘Engineering: Introduction to Erection All Risks Insurance 1977’. In this brochure, Swiss Re explains the basis for erection all risks insurance, risk assessment and ratings to insurance managers and engineers. Reports in the Swiss Re Archive from the 1970s tell of plant inspections. Examples include the reports on the fire risks of a hotel and an oil production plant in Banjul, Gambia, and of a chemicals and fertilizer manufacturing plant in Port Louis, Mauritius: SRCA 10.119 333.32, ‘Tropical Bungalows Hotel. Fire Survey Report 1976–1979’; SRCA 10.119 33.39, ‘G. P. M. B. Gambia Produce Marketing Board. Fire Survey Report 1976–1977’; SRCA 10.119 33.24, ‘Mauritius Chemical and Fertilizer Industry Ltd. Fire Survey Report 1977’.

⁸³ SRCA 10.117 086.01, ‘Personalstatistik für das Jahr 1969’, 16 February 1970, 10; SRCA 10.152 778, ‘Berufliche Ausbildung der Mitarbeiter der SR Zürich per 1.1.1982’, 16. A staffing analysis in 1994 indicated that 28 per cent of Swiss Re employees in that year were academics, with 8 per cent of them being engineers. SRCA 10.152 778, Gesamtbestand SR 1994, 1.

was out of the question. Instead, there had to be a risk assessment based on solid knowledge of the chemistry, physics, and technical processes of each industry.' This required scientific advice. Swiss Re then joined forces with Environmental Resources Ltd (ERL) in London, a consulting company with first-class references. With the involvement of scientists from various disciplines, ERL drew up an analysis of the various industrial branches' possible environmental impairment. Its analysis served as the basis for a handbook on classifying environmental liability risks. 'It classifies the individual industrial branches by their possible extent of peril, and covers all technical aspects to be noted while underwriting such risks.'⁸⁴

At the same time, a greater need for mathematical and technical knowledge in the reinsurance industry arose, as the insurance sector was starting to develop a knowledge-intensive simulation and modelling culture. This trend can be understood as a continuation of a push towards more mathematics in reinsurance that had established 'a connection with the newest methods of mathematical statistics and physics' since the use of stochastic methods in actuarial theory during the post-war era.⁸⁵ It is not clear to what extent the practice of underwriting was truly controlled by actuarial modelling efforts. However, each case's limits of what could be considered acceptable pricing were most likely set by complicated stochastic calculations. This is why in the final third of the twentieth century, actuaries' role in the reinsurance business became increasingly strategic and concerned with providing security.⁸⁶ On all accounts, the risk models as well as some of the new insurance models required more than just theoretical work. Their additional need for considerable computing capacity in particular brought about the search for technical computer specialists. In the 1960s, before the development of degree programmes in information technology, these specialists could be found among the graduates who had studied physics, applied mathematics, or electrical engineering.⁸⁷

As the strategic value and significance of knowledge in IT, the natural sciences, and actuarial theory grew, the role of those stakeholders of knowledge who used to be responsible for strategy became more operational in nature. The job of legal experts was then increasingly focused on checking contracts with respect to potential litigation. Yet they had to allow others to determine the strategic business direction.

Engineering, the natural sciences, and mathematics saw a period of real growth as part of reinsurance. They also served as the sources of knowledge feeding the transformation of reinsurance into an academic endeavour during the final third of the twentieth

⁸⁴ Swiss Re, *sigma* 4, 1974, 3. ⁸⁵ Vajda 1950, 11.

⁸⁶ See also Bühlmann and Lengwiler 2014; Vajda 1950.

⁸⁷ For information on the computer science programme at the Swiss Federal Institute of Technology Zurich (ETH) see: Gugerli, D., Kupper, P., and Speich, D. (2010), *Transforming the Future: ETH Zurich and the Construction of Modern Switzerland 1855–2005*, Zürich: Chronos, 290–6 and 301–6; Zehnder, C. A. (2003), 'Zürcher Hochschulformatik 1948–2003 im Spannungsfeld zwischen Wissenschaft, Anwenderbedürfnissen und Aufbau', *switchjournal*, 2, 43–6; Speiser, A. P. (1992), *95 Semester ETH—der Weg zur Informatik*, Zürich: Presse- und Informationsdienst ETHZ. Compared internationally to other universities, it introduced its own IT programme with some delay, in 1981. See Gugerli et al. 2010, 305.

century, a process clearly confirmed by the staffing statistics of that period.⁸⁸ This is why reinsurers also started seeing themselves more and more as a pool of real experts, dominating the discourse in the area of natural catastrophes in particular: 'insurance has recently increased its efforts to better grasp the natural catastrophe risks, which under certain conditions could threaten their very existence' was how *sigma* reported on the topic in 1980. The 'application of the latest scientific knowledge' enabled the development of 'methods for a targeted risk assessment, based on the analysis of previous events and using simulation models to assess the probability of future events of a defined size. It would then be possible to use an extensive technical and engineering investigation to assess the losses arising from the damages caused by the events.'⁸⁹

It is no surprise that Swiss Re started presenting itself as the 'House of 100 experts'.⁹⁰ Other reinsurers also emphasized their status as experts. And the more academic and actuarial specialist knowledge they had, the more naturally the idea came to mind of running an independent business as risk and technical consultants. Large companies running risk management programmes under constant observation and instruction by reinsurance groups' specialists could, as clients, expect to get a clear view of even the most complicated and seemingly out-of-hand risk circumstances. Indeed, from the mid 1970s onwards, risk management was becoming an increasingly fashionable topic: risks were to be identified systematically, particularly in big industry's corporate organization, logistics, costs, production, warehouses, distribution, and financing.⁹¹ The concept has been in use in different ways since then. Yet even so, the core contours of risk management were defined clearly back in the mid 1970s, with an established definition that still applies today, namely dealing with risks systematically by conducting 'risk mitigation with the goal of finding and implementing suitable measures to manage risk'.⁹²

⁸⁸ The percentage of academics employed who were mathematicians was between 10 and 30 per cent during the period from the 1970s to the mid 1990s (1970: 29 per cent, 1976: 14 per cent, 1982: 21 per cent, 1986: 11 per cent, 1994: 15 per cent). For engineers, this figure rose from 11 per cent in 1976 to 27 per cent in 1986 and 37 per cent in 1994. SRCA 10.117 086.01, 1967–1971, 'Personalstatistik für das Jahr 1969', 16 February 1970, 10, table 2; SRCA 10.152 763, 1972–1975, table 'Berufliche Ausbildung der Mitarbeiter der SR, Stand 1.1.76', 16; SRCA 10.152 778, 1981–1985, tables 'Berufliche Ausbildung der Mitarbeiter der SR Zürich, Stand 1.1.82' and 'Kadermitglieder', 16–17; SRCA 10.152 778, 1991–1995, 'Entire SR Staff (Estimated as per 1 April 1994)', 1.

⁸⁹ Swiss Re, *sigma* 6, 1980, 8.

⁹⁰ SRCA 10.152 778, '1000 Mitarbeiter bei der Schweizer Rück, Zürich', 1983.

⁹¹ *The Review* 1976, 13–15; Bullock 1977; Hardman 1979; Williams and Heins 1976. See also Giarini et al. 1976.

⁹² Swiss Re, *sigma* 10, 1981, 2.

CHAPTER 9

THE GLOBAL MARKET
AND LIBERALIZATION
1980–2010

THE reinsurance industry developed new knowledge infrastructure and strengthened its coordination and cooperation efforts as a response to the structural problems during the economic boom of the post-war era. It recruited more and more academics with degrees in mathematics, engineering, or the natural sciences. It particularly strengthened its cooperation with universities in the field of actuarial research and insurance-related economics. With this enhanced diagnostic potential on the one hand and its cultivation of a culture of sector-specific communication and expertise on the other, reinsurers succeeded in using relatively reliable methods to tackle the complicated situations of great uncertainty that many of their contemporaries were encountering in the late twentieth century.¹ During this time, the reinsurance sector's patterns of perception and how it focused on the world shifted in a gradual way that went almost unnoticed.

At first glance, everything was as it had always been. Reinsurers' complaints had not changed in any fundamental way. As always, reinsurers were under considerable pressure from the competition and thought that their clients' and competitors' signing policies were becoming increasingly short-sighted. Large direct insurers started, for the first time, underwriting on the international markets, which allowed them to diversify their risks. This diminished their need for professional reinsurance services. With cash-flow underwriting that was attractive during periods of high interest rates, they also had greater degrees of freedom, which led them to want to cover even larger risks themselves.² The business of reinsurers was thus increasingly conducted in the difficult 'long-tail' risk area. Indeed, the number of so-called 'captives' also grew substantially in the 1970s, with multinational industrial companies creating and operating their own insurance companies taxed at lower rates. The concerns of reinsurers stayed the same

¹ Habermas, J. (1985), *Die neue Unübersichtlichkeit*, Frankfurt: Suhrkamp.

² Swiss Re, *sigma* 2, 1989, 14.

and analytical possibilities were enhanced, but the sector's patterns of perception had started, step by step, to change.

1 THE LANDSCAPE OF GLOBAL
INSURANCE

In 1980, *sigma* examined the dependence of the insurance industry on the macroeconomic cycle during the 1970s. In the aftermath of the major recession of the mid 1970s, focusing on this topic was a logical choice. Yet the strictly global perspective that *sigma* took is quite striking. The publication examined cyclical business development as the connection between the development of gross world product and that of the global insurance business. Earlier findings regarding the economic cycle of the insurance industry seemed to confirm 'also worldwide' the hypothesis that the insurance industry moved in relationship to the growth trend of the economy overall, but its response was more pronounced in both directions.³ The study's authors admitted that national differences are lost in such comprehensive aggregates. In addition, it seemed to the authors that 'the disturbing influence of inflation makes it difficult to make the required calculations in a single currency. Despite this, it is possible to make a comparison of the development of the insurance industry with that of the general economy.'⁴ That was easiest to do when the analysis divided the world into 'regions of differing development regarding economics and insurance' instead of looking at each individual country—for example, into the three regions of 'North America (USA and Canada), other OECD (twenty-two industrial countries) and the rest of the world (primarily developing countries)'. Compared to the economy overall, the insurance industry's growth trend tends to overreact noticeably. The *sigma* authors explained that this sensitivity was also more or less apparent in the regions.⁵

The United Nations Conference on Trade and Development (UNCTAD) also published a report in 1980 applying worldwide standards to examine the global situation of the insurance industry. The UNCTAD's seemingly sober Technical Paper reported in depth on the market shares and business operations of the 191 professional reinsurance companies globally active at the time. In doing so, the paper drew a map of the world's insurance habitats. Although nation states still served a purpose for the map, namely to help sort data in the associated tables, for the most part they stepped back to give centre stage to the major players of the business and the world's multi-country regions with their special economic growth issues. Instead of drawing up a study on the entire insurance sector as requested, the United Nations Centre on Transnational Corporations intentionally had issued a report focusing exclusively on transnational connections in the reinsurance industry.

³ Swiss Re, *sigma* 2, 1980, 3.

⁴ Swiss Re, *sigma* 2, 1980, 2.

⁵ Swiss Re, *sigma* 2, 1980, 4.

The Centre found that reinsurers were still substantially more international and global than direct insurers, who were still subject to very strict (national) regulations. Reinsurers were thus a much more suitable object of study regarding the transnational services that had to be provided to cover the development and growth risks associated with the development potential of the global economy.⁶

UNCTAD was not known for dealing particularly benevolently with international business groups. Yet its transnational bird's-eye analysis of the world of reinsurance led to an interesting correction of economic and political perceptions of the sector. UNCTAD's view was that reinsurers were playing an important role and supporting growth in developing countries with weak direct insurance industries. A high share of reinsurance was the only factor enabling, for example, the investments of other multinationals in the natural gas business with developing countries to be sufficiently insured. In a way, international reinsurance groups were thus acting as private-sector aid organizations promoting the development of infrastructure worldwide.

It is noticeable in the report that UNCTAD had adopted an economic version of the Man and the Biosphere Programme launched in the early 1970s as one of UNESCO's environmental policy measures.⁷ If each ecological habitat had its own rules for sustainable development, then the same could be expected, analogously, of each economic habitat as well. Economic growth for all geographic regions and growth for the reinsurance industry were not mutually exclusive. The UNCTAD report focused most of its attention on these two kinds of growth. One of its first observations was that 'while insurance premiums have almost quadrupled worldwide during the period 1965–1970, world reinsurance premiums have increased almost sixfold.'⁸ UNCTAD backed up this statement with a corresponding claim in the *Financial Times*. The following paragraph of the report provided *sigma* statistics, painting a picture that was also impressive albeit not quite as spectacular. These statistics saw the worldwide premium volume of both direct insurance and reinsurance, taken together, increasing from USD 45 billion in 1965 to USD 78 billion in 1970 and USD 143 billion in 1975. This still represents a near tripling of volume within ten years.⁹

The amounts are not easy to interpret and the contradictory information in the UNCTAD report can be neither explained via calculations nor corrected empirically. It was difficult to determine the sector's premium volume through time. This was particularly true in light of the complex connections within the insurance industry, with its cross shareholdings, horizontal integration strategies, group and pool formation, and constantly shifting retrocession practices, and given the captives trend. This is why the technical paper also quoted different sources and looked at different time periods at the same time. The discrepancy cannot be explained, but it can be interpreted, namely as the attempt to make the growth of this service-providing sector seem as impressive as possible. Above and beyond this, the UNCTAD report overtly tried to draw special

⁶ United Nations Centre on Transnational Corporations 1980.

⁷ On the bird's-eye view of the post-modern era, see: Höhler, S. (2008), "Spaceship Earth": Envisioning human habitats in the environmental age, *GHI Bulletin*, 42, 65–85.

⁸ United Nations Centre on Transnational Corporations 1980, 4.

⁹ United Nations Centre on Transnational Corporations 1980, 4 and 5.

attention to the fact that huge differences between the world's various regions had to be taken into consideration. Measured by premium income, the report quoted *sigma* estimates and calculations indicating strong growth of the reinsurance market between 1965 and 1975, from USD 3.7 to 11 billion in Western Europe, from USD 1.4 to 4.1 billion in the US and from USD 0.5 to 3.1 billion in the other regions, composed primarily of Japan, Canada, and Australia. A paper by Pierre de Vogüé of Mercantile and General Co. that was presented at the first Third World Insurance Congress in Manila presented figures for the year 1975 that differed yet again from the other available figures, but were no less impressive. These figures had been published in *The Review* and in *Reinsurance*, and of course also been cited by UNCTAD.¹⁰

The situation of the reinsurance industry was thus not easy to describe, even using a good number of tables. Still, there were some clearly stated assessments and findings in the report. One of these was that reinsurance was still a growth industry with considerable potential. From the perspective of a supranational organization concerned with the development of the global economy, reinsurance could be viewed as a prerequisite for the economic growth of emerging markets. Yet at the same time, reinsurance was a business dominated by just a few companies that were active all around the world. However, the available figures on the reinsurance industry were sorted—whether by country, company, specializations, or size—reinsurance was still a predominantly European business in which the fifteen biggest of the overall 191 professional reinsurance companies were receiving over half of the total premium income. Yet within this group of top-ranking companies, two had overwhelmingly dominant market shares. According to an International Insurance Monitor report, Munich Re and Swiss Re accounted for almost half of the net premium volume of the fifteen largest reinsurers in 1977, with USD 2,147 billion and USD 1,467 billion, respectively.¹¹

Apart from the clear rankings in the reinsurance arena, the UNCTAD report also indicated, indirectly, how successful the development of sector-specific knowledge infrastructure had been. A large part of the information on which the report was based was taken from issues of *sigma* from the late 1970s. No matter how complex the conditions prevailing on the various insurance markets had been, reinsurers increased their global orientation and the power of their discourse in the last part of the twentieth century. In doing so, they secured a transnational perspective on their markets in a way that clearly changed the patterns of perception or 'mental maps' of their sector.

This transnational perspective started to have an operational impact on the reinsurance business in the mid 1980s. In 1984 and 1985, there was a flood of compensation litigation in the US, the world's largest national insurance market. These cases led to a veritable explosion of premiums in the liability business. There was a real 'liability and litigation crisis' facing the industry. The pressure on the reinsurance sector increased. As there was no way of containing the flood of litigation tied to US liability law and its case

¹⁰ de Vogüé 1978, 88.

¹¹ United Nations Centre on Transnational Corporations 1980, 6, based on *International Insurance Monitor*, April 1979.

law, the insurance industry had to find other methods to ease the burden.¹² These were found in two corporate strategy tools—tax optimization and choice of regulatory authority. What that meant, increasingly often, for globally active companies in the 1980s was relocating their offices or business domiciles to offshore states.¹³ This trend had its origins in the 1960s and 1970s in the tax optimization strategy using ‘captives’, namely self-insurance companies of large industrial companies. This process explains why Bermuda became the new ‘global location’ of the insurance industry, also affording reinsurers the opportunity to choose a location that had particularly low taxes and was very friendly to their sector.¹⁴ This development circumvented the competencies of national insurance supervisory authorities. The reinsurance sector had already divided the world into new niche markets and regions before the Cold War was over.

A first glance at the reinsurance sector of the 1980s sees them operating with the handbrake on most of the time and launching multiple diversification experiments. However, step-by-step changes to the analytical and mental toolbox available and how it affected the organizational form of reinsurance in the global economy should not be underestimated. The new global perspective became effective as regards the transnational liberation of the direct insurance market. This was in view of the fiercer global competition throughout the entire insurance industry, and due to the unmistakable trend towards structural convergence of globally active financial services providers. The changes in perception in the 1980s can be understood as the catalyst for the neo-liberal trinity of transnational liberalization, global competition, and dynamic financing methods. In other words, they announced early on a constellation that helped form the developmental phase of the worldwide insurance industry that was to follow. Two major local catastrophes further accelerated this development: Hurricane Andrew in Florida in 1992 and the terrorist attack on the World Trade Center in New York in 2001.

2 LIBERALIZATION OF THE DIRECT INSURANCE MARKETS

The 1980s were a transitional phase in the history of reinsurance that saw trends appearing that included developments regarding long-term economic policies. Such trends focused on breaking down impediments to trade caused by tariff rates and other factors.

¹² Moskowitz et al. 1988; Priest 1988.

¹³ See also Huber 1987; Lefkin 1988 and Clarke et al. 1988 on the ‘litigation and liability crisis’.

¹⁴ Swiss Re, *sigma* 4, 1994; Cummins and Outreville 1987; Cummins 2008, ii: ‘Bermuda has also expanded to provide reinsurance coverage for the other major jurisdictions worldwide and also provides a domiciliary jurisdiction for firms from Continental Europe, the UK, Asia, South America, and Africa. Thus, Bermuda has evolved from primarily a domiciliary jurisdiction for captives (pre-1980s), to a reinsurance market primarily for liability insurance and property catastrophe reinsurance (1980s and early 1990s), to a world leader in taking on all types of insurable risks (mid 1990s to the present day).’

National governments were gradually giving up their strategy of offering their own domestic markets the best possible protection while at the same time paving the way for the national exports industry (at times with the help of military power) to enter foreign output markets. Instead, they started focusing strongly on increasing the volume of world trade overall. National legal provisions no longer based their rules fundamentally on products’ origins. Instead, lawmakers reformulated the regulations so as to treat domestic and foreign goods equally. This initially resulted in a huge increase in the complexity of negotiations. Negotiations now focused on coordinating markets with the goal of having the regulatory provisions of other states accepted in a given domestic market or, ever more radically, of developing international regulatory principles with supranational validity.

The Bretton Woods system was set up to manage this economic and political agenda directly after the Second World War. It brought about not only a new framework governing the international system of currencies with fixed exchange rates, but also created a global forum for negotiations of unprecedented scope and ambition. The General Agreement on Tariffs and Trade (GATT) was developing into an agreement to dismantle customs-related and technical barriers to trade, one after the other, in numerous rounds of negotiations. To the dismay of the insurance industry, this process initially focused its attention exclusively on the trading of goods. Liberalization measures for services were not discussed until the Uruguay round between 1986 and 1994. It was not until even later, in 1997, that these negotiations on equal market access for telecommunications companies and financial services providers could be brought to a conclusion. They were integrated in the provisions of the Uruguay round, becoming part of the General Agreement on Trade in Services (GATS), with a procedural delay.

The development of economic policy was somewhat different in the European Economic Community. A veritable laboratory for an ordered transition to a free market economy had been developed in Europe in connection with the Marshall Plan. It was based on the political goal of achieving lasting peace by reining in armament-fuelling steel industries, particularly those of France and Germany, within the European Coal and Steel Community of 1952. The 1957 Treaties of Rome served to further liberalize the economic policies governing European trade in general terms. Although the European agreements were very comprehensive and extensive in form and intended scope, the grand project of creating a European economic community had, at its core, a catalogue of goals that included just eleven points. The first three of these points were without doubt the most important. They focused on the elimination of customs barriers within Europe, the introduction of a joint customs tariff for Europe’s trade with the rest of the world and ‘the abolition, as between Member States, of obstacles to the free movement of persons, services, and capital’. The governments were expecting no less than ‘a harmonious development of economic activities, a continuous and balanced expansion, an increase in stability, an accelerated raising of the standard of living and closer relations between the states belonging to it.’¹⁵

¹⁵ Treaty establishing the European Economic Community, Rome, 25 March 1957, Articles 2 and 3, 169; available at <<http://eur-lex.europa.eu>>, accessed 15 June 2013.

Yet in Europe as well, eliminating trade barriers basically meant removing obstacles to the free movement of goods. The area of transport insurance had to be liberalized in order to facilitate the movement of goods. It was thus the only kind of insurance that was already liberalized in the 1950s under the supervision of the Organisation for European Economic Cooperation (OEEC).¹⁶ In contrast, ensuring the free movement of persons and capital initially remained a matter of secondary significance. This was an enormous disadvantage for reinsurers who depended on international connections. Because of the broad spectrum and density of national regulations for service providers, governments were very hesitant to include insurance within the framework of negotiations toward liberalization. Hence, insurance remained a tough nut to crack for a long time. The efforts to progressively remove trade barriers for financial services as well, and to harmonize the European Single Market (1992) in this sector too did not get going until the principle of mutual recognition of regulatory provisions was applied to the insurance industry with the rulings of the European Court of Justice in 1979 (Cassis de Dijon) and 1986. From 1994, the principle of mutual recognition of regulatory provisions was applied to banks and insurance companies. Financial services providers were then able to offer their products at branch offices in all member states. The decisive factor here was the ability of European policies to manage the conflicting interests of national regulators on the one hand, who were concerned about stability and security, and the demands for free market access with ever greater liberalization on the other.¹⁷

The same can be said about the liberalization of the movement of capital. This policy area was also approached in a careful way as part of the re-conceptualization of the international economic system after the Second World War. However, the movement of capital among, for example, the member states of the International Monetary Fund initially remained subject to numerous controls. Indeed, with Bretton Woods, the advantages and disadvantages of stable regulations for international payment transactions became apparent at the same time.¹⁸ Yet those approving the gradual removal of trade barriers to the movement of goods had also to facilitate the movement of capital soon. In a system of free movement of goods, effective controls could not be successfully conducted, as it was possible to undermine them at any time via fictitious transactions. Simply paying an invoice after placing an order without any goods actually being shipped was enough to have a well-functioning means of moving around capital freely. This was part of the

¹⁶ Werner 2010.

¹⁷ Werner 2010, 96. See also Höpner, M. et al. (2009), 'Liberalisierungspolitik: Eine Bestandsaufnahme von zweieinhalb Dekaden marktschaffender Politik in entwickelten Industrieländern', *Max-Planck-Institut für Gesellschaftsforschung: Discussion Paper*, 7, which on p. 6 lists three central tools of liberalization policy: '1. Progressively eliminating long-term, state-administered cross-subsidies (to promote the principle of individual responsibility); 2. Strengthening private property and the freedoms associated with it (to promote the principle of decentralized decision-making); and 3. Pursuing competition policy via state intervention against monopolies and other obstacles to and distortions of competition (to promote the principle of competition)' (translated quote).

¹⁸ Werner 2002.

reason why the Bretton Woods system had already started to erode at the end of the 1950s, long before its failure was admitted at the start of the 1970s. Exchange rates then started to float, financial markets became volatile and computer-assisted international payment and stock exchange trading systems were established. This led to increased pressure for liberalization, which could be directed into the comprehensive planning of economic policy for the European market.¹⁹ At the end of the 1980s, controls on the international flow of capital within the European Community, the OECD, and the IMF, also had to be formally loosened. The attention of economic policymakers shifted from liberalization focused on industrial goods to liberalization which included service products. This was an expression of the increasing macroeconomic significance of the third sector.²⁰

The conditions in which the insurance industry was operating changed radically with these liberalization tendencies. The overall framework for market access and state supervisory authority was fundamentally reshaped in three phases. The first phase in the development of directives saw insurance companies being granted the *freedom of establishment*. However, the host country's supervisory authority and regulations governed any foreign insurers as well. This principle of host country control had already taken effect for reinsurers in 1964, for non-life insurance companies in 1973 and was applied to life insurance companies as well from 1979. The second phase of evolving directives focused on the freedom to provide services, which was granted to insurers as regards large risks policies from 1988 and for motor vehicles and life policies from 1990. Supervisory deregulation and the transition to the principle of home country control did not come about until the third phase of directives, with its introduction of the single European licence. Insurance tariffs and conditions were liberalized at the same time (1992). For the first time in the history of the regulation of insurance, solvency checks were introduced instead of pricing and product regulations. This control over solvency set minimum standards for insurance companies in technical terms related to their finances and mandated methods for calculating technical reserves. It also told insurers what kind of assets they may hold and what limits they were to respect when allocating their funds to the various asset classes permitted. Together with the liberalization of the movement of capital, this development gradually increased the pressure on insurance companies' assets management departments as well.²¹ *sigma* spoke somewhat ambiguously of a 'revolution in the political order—or political structure' that had 'the potential to introduce a fundamental increase in the competitive dynamics of the national insurance markets'. It went on to state that this revolution had granted considerably more freedom of action to not only foreign companies (single market effects), but also to domestic providers (deregulation effect).²²

¹⁹ Abdelal, R. (2006), 'Writing the Rules of Global Finance: France, Europe, and capital liberalization', *Review of International Political Economy*, 13: 1, 1–27.

²⁰ Reference to the connection between liberalization in the services sector and the increasing significance of the third sector was made by Maffucci, M. (1981), 'Liberalization of International Trade in the Service Sector: Threshold problems and a proposed framework under the GATT', *Fordham International Law Journal*, 5: 2, 371–409.

²¹ Werner 2004.

²² Swiss Re, *sigma* 7, 1996, 9.

Even in the mid 1990s, it was still only possible to hypothesize as to the consequences that this new regulatory culture could be expected to have for the insurance industry. Thus, observers watched the developments regarding the weakly regulated reinsurers (that had always operated internationally) with mixed feelings. After all, it was easier to get an overview of and assess a regulated direct insurance market than a market that had to bear unforeseeable effects of competition. At the same time, legislators in the European Union were aware that a certain degree of cooperation in the insurance industry was necessary. For example, in 1991 the EU formulated a 'block exemption' as follows: 'cooperation between undertakings in the insurance sector is, to a certain extent, desirable to ensure the proper functioning of this sector and may at the same time promote consumers' interests.'²³

The insurers initially expected an increase in the number of providers in the market, above all an increase in the number of specialists, banks, and foreign insurers with little experience in dealing with (local) market conditions and at risk of incorrectly interpreting the available information.²⁴ Accordingly, it could be expected that the risk of error would increase in the direct insurance market in future, and that quotes would be given at dumping tariffs, which would increase the transfer of bad risks to the reinsurers. Apart from this, differentiation on the basis of country of origin and country of operations had to be eliminated, as it would have meant that the regulators were engaging in discrimination against domestic insurers, given the increasing significance of foreign branch offices. At least initially, the liberalization of insurance tariffs and conditions would most likely decrease market transparency and companies would no longer be competing solely via the efficiency of their sales and distribution structures, but rather at the same time via tariffs, products, underwriting criteria, and credit ratings as well. Furthermore, it had to be assumed that 'bad risks' would be more difficult to insure in the future.²⁵ *sigma's* in-depth market report of 1996 went on to say that in future it would also no longer be possible to cross-subsidize the cost of insuring industrial risks with income from the mass risks business. As it stood, each and every insurance line would have to get by with the results that they managed to generate themselves. And in the end, narrower margins and more volatile results were to be expected from the boost to competition produced by economic policymakers. As a consequence, the demands made of insurers' capital management also increased. They were only able to refinance themselves on globally interconnected markets when they met the criteria of the rating agencies, achieved an attractive level of return on equity, and paid attention to increasing capital productivity. *Shareholder value* thus became an important strategic buzzword for the insurance industry as well.²⁶

²³ Council Regulation (EEC) No 1534/91 of 31 May 1991 on the application of Article 85 (3) of the Treaty to certain categories of agreements, decisions, and concerted practices in the insurance sector; available at <<http://eur-lex.europa.eu>>, accessed 15 June 2013.

²⁴ Swiss Re, *sigma* 7, 1996, 9.

²⁵ Swiss Re, *sigma* 7, 1996, 9.

²⁶ Swiss Re, *sigma* 7, 1996, 27–32.

3 COMPETITION AND MARKET CONCENTRATION

Although the expected development trends could hardly be checked in empirical terms, these insurance-economic liberalization scenarios were of utmost importance for reinsurers in the mid 1990s. They had to act now without knowing exactly what the future would bring. If it should turn out that the competitive pressure among direct insurers increased when they began to operate on an international level and intensify their capital management, then the reinsurers would have to anticipate their clients' development and get ahead of it. For this reason, the reinsurers braced themselves for tougher competition for premiums and tried to increase operations on an international level. They also began to view their business as more of a financial service operating in the area of capital management.²⁷ Small, newly founded or highly specialized direct insurers would continue to be dependent on keeping their equity capital relatively low with the help of reinsurance and their risk distribution offers. Whatever the hopes were in the 1970s for improved market coordination through agreements, industry-wide market analyses, or mutual rating systems, they were now being thrown overboard. Lukas Mühlemann, the new CEO of Swiss Re, spoke of a total about-turn. There were many changes at that time, both in areas of business and in overall strategy. The proposed solution of the reinsurers in the mid 1990s was competition. 'We want to become number one,' explained Mühlemann and at the same time, made the ratio of equity capital and earnings the central gauge for assessing performance—'in the mid term we want to achieve a return on equity of 15 per cent.' The primary strategic tools were now no longer viewed in direct or indirect agreement, but rather in direct competition or in an '(un)friendly takeover' and merger.²⁸

A huge natural disaster paved the way for this new economic-political and strategic constellation of the 1990s. In August of 1992, Hurricane Andrew ravaged over 60,000 residences and left over a quarter of a million people homeless between Florida City and Miami. Of the losses incurred, which were later estimated at USD 23 billion, 7.3 billion had to be covered by insurance companies.²⁹ Of these, eleven went bankrupt. There could be no doubt that the insurance industry was no longer able to deal with natural disasters of this scope without fundamentally rethinking its business models. Hurricane Andrew tore across the landscape at a wind speed of over 250 kilometres per hour, razing not only the lightweight timber houses, inadequately secured mobile homes, and open

²⁷ See Kyrtis 2014.

²⁸ For more on this radical strategy of increased competition, see the informative interview with Lukas Mühlemann in Swiss Re 1994 from which this quote is taken. Also Swiss Re 1995; Trauth and Barnshaw 1999; Altemöller 1999. *sigma* even wrote of a new market era of insurance under the conditions of deregulation and market opening, Swiss Re, *sigma* 7, 1996.

²⁹ Zanetti et al. 2007, 35. Measured in USD in 2006.

shopping malls but also senior citizen and holiday homes, thereby clearing out a large insurance market and demolishing the insurance industry of Florida.³⁰

As far as the organization of the worldwide insurance industry was concerned, the experience of Hurricane Andrew served to accelerate moves towards greater liberalization. On the supply side of the market, now thinned out and marked by capital scarcity and high demand, emerged a host of new insurance companies. These new companies could freely choose their location on the basis of tax and regulatory factors, and relocate their domicile to loosely regulated Bermuda. As many providers had been thrown out of the market and premiums had risen again in the aftermath of Hurricane Andrew, many offshore direct insurers and reinsurers specializing in natural disasters established themselves there. Bermuda became the world's fourth-largest reinsurance market.³¹ In 1993 alone, USD 4 billion flooded into the creation of eight new catastrophe reinsurers in Bermuda.³²

In technical and methodological terms, Hurricane Andrew caused reinsurers to further increase their analytical capacities and thematic leadership regarding natural disasters, especially with regard to climate change.³³ Moreover, they were basing their business more and more on probability and computer-aided modelling techniques for virtual events and simulated losses of unprecedented size. This made the reinsurance industry realize that Hurricane Andrew was in no way the worst of all imaginable scenarios. For this reason, direct insurers began to hedge even more against very rare but especially large events. In turn, the significance of (large) reinsurers in the area of natural disasters grew once again. Although it quickly became apparent that the models, even with increased complexity and sophistication, were always dependent on the quality of the available data, this form of risk assessment meant that the reinsurance industry went through an even greater transformation process than before. It changed into a knowledge-processing and knowledge-producing industry.³⁴ Furthermore, computerized models of natural disasters were used because of the huge need for solid data, especially at the large reinsurance companies. Thanks to their large business volume, these companies had an overview of the entire market.³⁵

Hurricane Andrew also had serious consequences for the financing of reinsurance. Robert C. Goshay and Richard L. Sandor, the chief economist of the Chicago Board of Trade (CBOT), had already created the theory for reinsurance-specific futures in 1973 and the CBOT had started to trade with futures and options for US risks even before the great hurricane.³⁶ However, it was not very successful and the experiment was discontinued. The securitization of catastrophe risks grew to a modest level only after Hurricane Andrew. The securities traded under the collective name of insurance-

³⁰ For more on the course and impact of Hurricane Andrew, see Harper 2005; and on the bankruptcies of the local insurance industry, see Graham and Xie 2007, 99.

³¹ Holzheu and Lechner 2007, 893.

³² Cummins 2008, 6. ³³ Werner 2014. See also Sturm and Oh 2010.

³⁴ Hendrick and Hindle 1997. ³⁵ Heys 2003. ³⁶ Goshay and Sandor 1973.

linked securities allowed the insurance industry to expand their capacities with the help of the financial markets and to overcome the threat of capital bottlenecks after Hurricane Andrew. Since Hannover Re was the first to issue a successful catastrophe bond for USD 85 million in 1994, the market for cat bonds first, and then for life bonds increased tremendously. In 2004, there were insurance-linked securities in circulation for over 12 billion. Through these the reinsurers were able to pool (private) risks and put them on the capital markets in this new market form.³⁷ Why investors found this offer so attractive, why they preferred derivative products over direct investment in reinsurance, despite their high fees, is still debated among insurance economists.³⁸ In the mid 1990s, the reinsurers themselves believed they could hedge the portfolio of a direct or reinsurance company on the financial markets more precisely. They used the new tools of alternative risk transfer with its greater product differentiation, even though they were based on indices and not on indemnity.³⁹ In effect, the diversity of risk transfer vehicles on the financial markets had become nearly unmanageable within just ten years.⁴⁰

All three effects of Hurricane Andrew—the Bermuda boom, computer-aided modelling culture, and catastrophe-linked financial market derivatives—were closely linked with and reinforced by the economic and political trends of the 1990s. The new financial market instruments allowed for more sophisticated asset management. At the same time, the increased competition within a deregulated direct insurance market required even more exact assessments of risk portfolios. To do this, reinsurers and insurers alike used the new possibilities of deregulated service markets, liberalized movement of capital, and expanded forms of finance.⁴¹

In terms of corporate strategy, the leading reinsurance companies responded to the challenges of global competition by selling their stakes in direct insurers (Swiss Re) or through a clearer division of labour between the direct insurance and reinsurance areas of the corporation (Munich Re). Instead of focusing as before on cross-company cooperation, vertical integration, and diversification, the strategy of horizontal expansion and competition now prevailed. There was a large wave of mergers and acquisitions, as was also the case among direct insurers and banks. Between 1990 and 2003 the world's four biggest non-life reinsurers increased their market share from 20 per cent to 36 per cent, and in life the market share increased in 2003 to 57 per cent.⁴² In the US, the largest

³⁷ Kobrak 2012, 302. Laster and Schmidt 2005, 32–3.

³⁸ Harrington and Niehaus 1999; Cummins et al. 2004. A brief summary of the diverging opinions is given by Cummins and Weiss 2009, 495–501.

³⁹ Swiss Re, *sigma* 5, 1996, 10. Baur and Schanz 1999.

⁴⁰ A typology by Cummins and Weiss 2009. For an overview after ten years' experience, see Helfenstein and Holzheu 2006. See also the conservative report of the Group of Thirty regarding the relationship between reinsurance and the international financial markets, Group of Thirty 2006.

⁴¹ Trauth and Barnshaw 1999, 4.

⁴² The large specialized reinsurers, also labelled as professional reinsurers, were able to expand their market shares through organic growth and a wave of mergers and acquisitions (M&A) during the mid and late 1990s. From 1990 to 2003, the four largest non-life reinsurance providers increased their market share from 20 per cent to 36 per cent. The concentration was higher in life reinsurance in 2003

insurance market in the world, the reinsurance business was centred upon a few major providers. Despite the growing market, the number of reinsurance companies was cut back by nearly half during this time.⁴³ Within just a few years, the market was significantly consolidated between Munich Re, Swiss Re, Lloyd's, Hannover Re, GE Insurance Solutions, Everest Re, Berkshire Hathaway Reinsurance and Partner Re.⁴⁴

4 REINSURANCE AS A FINANCIAL SERVICE

Every development phase in reinsurance was connected with the questions of what reinsurance really is, what is its core business, and how does it work best? During the course of its 150-year history, reinsurance companies have at times been the independents of insurance, and at other times the spearhead of the insurance industry's international nature. They saw themselves as the coordinators between different branches of insurance, the methodical and forward-looking planning partners. They took care of corporate integration, served as patrons of pools or as ambassadors of the market economy, acted as specialists of professional risk management or as experts for large losses globally, and experimented as pioneers for computer-aided modelling. Every change in identity, every pressure to adapt because of the economy, every new threat created by commissions, competitors, clients, and catastrophes, led to a change in that which was at the time called the 'core' of reinsurance and what was supposed to be built up as a promising field. The greater the announcement made, the more fundamental the subsequent correction in self-image would be. Only the assumption that the question of the essence of reinsurance had become unnecessary under the conditions of the market consolidation was wrong.

From a historical perspective, some of these many past beliefs appear in a curious light considering the diverse roles played. Just think about the reservations a continental reinsurance company had when confronted with an American excess-of-loss agreement in the 1920s. By the same token, today's reinsurance companies are likely to view the usual retrocession quotas of yesterday with sheer disbelief. Such 'curiosities' of the distant past are easier to deal with than the more recent history of expectations and customary practice. How would reinsurance companies deal today with the predictions that influenced their actions not long ago but from which they had now started to break away? The reason for this difficulty is that terms carry contextual fields of associations, thus leading to a change in their effect when the context changes. Terms such as

with a market share of 57 per cent for the top four players. The winners of consolidation include the Bermuda-based reinsurers, who increased their market share from 0 per cent to 14 per cent between 1990 and 2003. Lloyd's of London saw its market share erode from 7 per cent in 1990 to 4 per cent in the late 1990s, recovering to 6 per cent by 2003.⁴⁵ Holzheu and Lechner 2007, 879.

⁴³ Holzheu and Lechner 2007, 891.

⁴⁴ For the top ten among reinsurance companies, sorted according to non-life net written premiums, see *Reinsurance* 2005, 25.

'return on equity' and 'rating', 'financial market supervisory and system relevance', 'regulation and transparency' produce other associations today and have gained a different kind of acceptance and trigger different responses than before 2008.

The same is true of the terms 'convergence' and 'financial sector' and their associated expectations. By the mid 1990s at the latest, the similarity in the roles of banks and insurers was seen as an interesting opportunity to expand the reinsurance business. Lukas Mühlemann in 1994, for example, saw it as 'an attractive option to cooperate more closely with Credit Suisse Holding in certain areas such as financial reinsurance or derivatives'.⁴⁵ Three years later that was no longer just Mühlemann's personal opinion or operational insinuation. Instead, it corresponded so much to general expectations that an operational convergence between banks and insurance companies had at times to be denied. Indeed, at the end of December 1997, Credit Suisse Group and Swiss Re made an exception to their policy to never officially respond to or deny rumours in a statement on the upcoming merger between Swiss Re and Credit Suisse: 'Credit Suisse Group and the Swiss Reinsurance Company state that speculation concerning a forthcoming merger is entirely without foundation'.⁴⁶

The hopes, expectations, and certainties connected in the 1990s with the convergence can be explained in two ways. One explanation is functional and is based on the problem of risk and maturity transformation. Banks are known to transform short-term deposits into long-term loans and reduce default risk through constructing appropriate portfolios. Insurance companies also contribute to risk transformation. With long-term policies in life insurance or with mass-issued, standardized policies, which are generally easily renewed (such as motor liability insurance), they transform the risk of a short-term burden through heavy losses. They distribute risks in time, space, and form. In this way, both banks and insurance companies increase the leeway of their clients. Issuing credit and the contractually guaranteed promise of reimbursement reduce the amount of reserves required for possible claims and the equity cover for ongoing operations. With regard to the problem of maturity and risk transformation, banks and insurance companies thus fulfil very similar functions. For example, savings contracts and life insurance in terms of maturity and risk transformation, operating loans and liability cover in terms of optimization for capital requirements of clients and the portfolio management with regard to risk distribution are all functionally similar.

From this analytical perspective, the financial-sociological question could be asked whether the functional similarity between insurance companies and banks always existed but differed only in the tools used. Or the historical question could be asked why such functional similarities have become so popular among decision-makers in banks and insurance companies, since the latter part of the twentieth century that banks bought insurance companies and insurance companies were convinced of the need to get into the banking business. This second question is more useful for understanding the

⁴⁵ Swiss Re 1994, 6.

⁴⁶ Swiss Re and Credit Suisse Group 1997, 'Statement by the Credit Suisse Group and the Swiss Reinsurance Company', Press Release, 12, December 1997.

organizational history of reinsurance because it can explain the stark difference between banks and insurance companies that has re-emerged since 2008.

Despite the central role banks played in founding reinsurance, these financial service providers crossed paths most often over the course of their history in asset management, and since the 1980s to a greater extent on the financial markets. When reinsurance companies strived to offset the risks of their underwriting strategies with their investment policy they ended up in a situation where, whether they wanted or not, their financing business did not fundamentally differ from that of banks. Government bonds or the real estate market are examples of this. At the end of the twentieth century, banks and insurance companies both discovered the financial markets as an opportunity to expand their capital basis. Since reinsurance companies had begun to experiment with tools of alternative risk transfer (ART), they increasingly became familiar with the same elaborate methods banks used to offset interest rate and currency fluctuations. Approaches to financial market theory were translated into the world of reinsurance and integrated into comprehensive risk theories. What was new and particularly popular was, for example, the synchronization of terms of investments and reinsurance policies.⁴⁷

The ending of the Bretton Woods system increased the requirements for banks and reinsurance companies to offset interest rate and currency fluctuations and build reserves. Whilst banks turned to derivatives for this purpose, reinsurance companies created a new business area: financial reinsurance. Financial reinsurance served them to some extent as an external equalization provision.⁴⁸ To be successful at reinsurance, the reinsurance companies had to rely on analytical and methodical imports from financial mathematics, as had become customary at banks. To what extent a transfer of knowledge between traditional insurance risk management and financial risk management played a role in the expectation of convergence between the banking business and the insurance industry should be investigated in greater detail.⁴⁹ In fact, they went separate ways and were relevant for different stakeholders in different ways. Whilst for some the main concern was to be able to provide financial services from a single source to best exploit existing client potential, especially in private banking, others based their convergence expectations on the view that banks and insurance companies could be a meeting point for savings assets. It therefore had to be possible to generate additional income with high growth in *assets under management* and investment of income from the assets. It stands to reason that with regard to asset management, the insurance companies learnt from banks how to generate additional income from new financial products. And both areas applied new financial market and risk models to better control their capital resources.

In any case banks and reinsurance companies each tried with their own tools to optimize shareholder value, whether it was as a creditor and asset manager or as a distributor of risk and specialist in building adequate reserves. And both based

⁴⁷ Interview with Bruno Letsch, 26 November 2010.

⁴⁸ Society of Actuaries 2000.

⁴⁹ See also Haueter 2014.

their work on experts in financial mathematics or secured the services of investment advisers and investment bankers, either by financing them or buying them outright.⁵⁰

This was certainly a consequence of the applicable equity capital requirements and tax laws. Reinsurance companies learnt to use the right financial instruments and accounting techniques for themselves and to offer them to clients. However, the more confusing direct insurance business became and the more differentiated the demand for cover and financing of risks looked, the smaller the number of companies became that could control what was happening on the reinsurance market. The few who succeeded achieved their dominance through systematically expanding their capital base and analytical capacities and by securing an unbeatable market overview and position through takeovers. Ideally, they would have transformed into large 'interactive enterprises where know-how could flow unhindered,' explained Lukas Mühlemann in 1994.⁵¹ Because as much as the global reinsurance business was bound to equity capital and market analyses, the success of takeovers and mergers depended on whether the company had the kind of capital needed and could sufficiently estimate the assets of the takeover candidate. Whilst they used the formulae of business consultants to make organizational changes and the position of the modellers expanded, modern finance specialists were the ones who increasingly took over asset management.⁵²

What is striking is that the existing cross-company organization of the reinsurance industry was differentiated further. The market concentration shifted possible market-coordinating services to the big companies, thus backing an internal functional differentiation of market leaders. In light of the wave of mergers and acquisitions and the trend towards more competition, it hardly would have been sensible to invest in a sector-wide infrastructure of knowledge. Instead they spoke of a new era of 'all-finance'⁵³ and of a possible convergence of banking and insurance as a result of the increasing similarity of their analytical and operational tools. This corresponded to the general expectation that with the growing significance of the financial markets for the insurance industry's investment business, not only would the primary and reinsurance companies consolidate into a 'combined insurance system,' but also the insurance industry and banking sector (the all-finance trend).⁵⁴ The results of gradual deregulation and development in the financial markets with their new products had the effect of accelerating both. 'Convergence can now be seen as a realistic possibility, although there are numerous legal and regulatory hurdles to negotiate as the boundaries between the products become increasingly blurred,' wrote one author in *The Review*, in 2002.⁵⁵ It is not surprising that agreements concluded by insurers, banks, and reinsurance companies with

⁵⁰ In 1998, Swiss Re acquired takeover specialist Fox-Pitt, Kelton.

⁵¹ Swiss Re 1994, 4.

⁵² Interview with Bruno Letsch from 26 November 2010.

⁵³ Berghe, L. van den and Verweire, K. (1998), *Creating the Future with All Finance and Financial Conglomerates*, Boston, MA: Kluwer Academic Publishers.

⁵⁴ Swiss Re, *sigma* 7, 1992, 1.

⁵⁵ Ross 2002. See C. W. Smith 1986; also Rawlins 1991 and Cummins 2005 and completely unwavering, even after the financial crisis of 2007/2008, Cummins and Weiss 2009.

specialized asset management companies were dissolved at the end of the 1990s through the purchase and integration of previous contractual partners.⁵⁶

Given the extensive process of concentration, the new financing tools in a deregulated, global insurance market, and the creation of additional analytical capacities in the large reinsurance corporations, one could have expected the industry to be well prepared for other events of the magnitude of Hurricane Andrew. Natural disasters had long ceased to be the primary territory of reinsurance on the imputed and operational limit of insurability. Depending on the status of cyclical premium growth, the industry considered itself operationally able to manage natural disasters and the immense damage they cause at any time.⁵⁷

However, the history of insurance-relevant major loss events is always a story of big surprises. With the terrorist attack on the World Trade Center in New York on 11 September 2001, an entirely new type of limit to insurability in the area of man-made catastrophes was revealed. Suddenly, it was no longer 'only' about the capital-intensive consequences of natural forces that had gotten out of control. Until then, it had been assumed that they could not be topped. Nor did it have to do with a bombing of a tube station, the hijacking of a wide-body aircraft or a terrorist attack on military headquarters. They had to learn that disasters created by man, with a sufficiently insidious selection of targets and means, formed their own category of insured losses, none of which could be foreseen. 'Until September 11 there was clear understanding of natural catastrophe losses. Seven months later, the industry is still getting to grips with the loss implications from man-made disasters,' was one of the many comments on the subject in *The Review*.⁵⁸

The huge volumes of insured losses from 9/11—estimated by the industry to have exceeded USD 32 billion—was not the most important aspect of the event.⁵⁹ Also, the fact that no one thought it possible for the Twin Towers to collapse was not something that really shook the industry. They did develop damage scenarios of a major fire in the WTC, but only with partial structural damage, thus leading to a seemingly incorrect appraisal of the possible extent of a catastrophe. Any appraisal which had taken into account actual events would have rendered the risk uninsurable. What was more serious than the narrow range of scenarios, was the fact that almost all direct and reinsurance lines were impacted by 9/11 at the same time.⁶⁰ This fundamentally called the possibility

⁵⁶ Laster and Wong 2001, 32; Laster and Sbaschnig 2002, 15–17.

⁵⁷ Smolka 2006.

⁵⁸ Schanz 2002, 16.

⁵⁹ For the insurance industry, the compensation amounts due were substantial. They were once again well over the amount of the Northridge earthquake in Los Angeles in 1994. In 1995, the losses from the Northridge earthquake were at USD 30 billion, Swiss Re, *sigma* 3, 1995, 20.

⁶⁰ 'The Insurance Information Institute currently estimates the total losses from September 11, 2001 at USD 32.5 billion. This comprises USD 9.6 billion in property claims, USD 11 billion in business interruption claims, USD 3.5 billion in aviation liability claims, USD 4 billion in other liability claims, and USD 3.4 billion in claims from other lines of business (Hartwig et al. 2004). The resulting capacity shortage and rate increases were widespread over all geographic regions and lines of business.' Holzheu and Lechner 2007, 886.

of cross-industry risk distribution into question: the losses caused by the attack in terms of life, liability, industry, and air traffic, as well as the direct and indirect repercussions on the financial markets and the subsequent tedious court procedures made 9/11 the insurance industry's event of the young century. One single attack had caused devastation the world over and practically for the whole of the insurance industry. 9/11 jolted not only the world order, but also raised doubts about the insurability of future terrorism losses in a globalized world.

Given the fully unexpected accumulation risks across industry lines, one could have expected in the aftermath of 9/11 another phase of reorientation to have occurred in the reinsurance industry. But this was not the case. After all, the global risk distribution function had worked very well and industry capacity was also able to absorb the enormous losses. The results for the insurance industry were not so complex: terrorism risks were then systematically excluded, transferred into separate policies or delegated to the state. The policies became more precise and the premiums rose substantially. But overall, 9/11 reinforced lines of development and corporate strategies. Industry insiders saw this coming. 'Perhaps the hard market will be shorter, the launches will be fewer (Bermuda can't be invented again), and the inevitable decline in pricing that is sure to follow will be less severe (after all, the big four can check it if they wish to), but these are hardly fundamental changes, and none of them are a result of the atrocious calamity in Manhattan,' commented an observer in *The Review*.⁶¹

Some of the larger reinsurance companies could process large volumes of premiums, had a transparent structure, had introduced the latest accounting standards and operated worldwide. They operated with great regulatory independence and enjoyed an especially high level of trust among rating agencies and investors. These big players in the reinsurance market also were able to refinance faster and for less than all the others.⁶²

For this reason, 9/11 was not a correction, as was the case with Hurricane Andrew. It was rather a reinforcement and accelerator of the existing trends in the insurance industry. Mergers and acquisitions did not come to a standstill and the development of tools for alternative risk transfer to the financial markets continued with the help of insurance-linked securities. The limit of the insurable demonstrated by 9/11, which in the end was a limit to the distribution of risk, became clear to the market players. This was particularly the case where they had tried to expand the risks of international terrorism into an independent insurance line.⁶³ In this regard they made no headway. Jack Seaquist, a 'terrorism model product manager' at a leading risk-modelling company (AIR Worldwide), tried in September 2006, the fifth anniversary of 9/11. He pleaded in vain for the necessity of dealing in greater depth with the issue of terrorism. Only with the aid of a 'comprehensive terrorism risk assessment' would you be

⁶¹ Baxter 2001, 14.

⁶² Around 20 billion USD in new capital is reported to have been invested in the worldwide insurance industry directly after 9/11. See Schanz 2002, 16.

⁶³ Rhee 2005.

able to account for possible losses from attacks in an optimized insurance and reinsurance portfolio.⁶⁴

Apart from this sideshow of industry development, the trend of convergence continued. The reinsurance industry had begun to reorganize, reduce, or sell entirely their holdings in the direct insurance business. In turn, they gradually eased into a role that was normally reserved for banks. By the same token, more and more banks not only invested in reinsurance companies, but also provided their own reinsurance-like services or even operated their own reinsurance companies. 'Banks have become more interested in setting up their own re/insurance companies or at least taking partial stakes in them,' noted *The Review*, citing several notable examples: 'Goldman Sachs recently invested in new Bermuda start-up allied World Assurance, and Warburg Pincus was one of the backers in Arch Capital's reinsurance operation Arch Re. Some have gone as far as to set up wholly owned reinsurance subsidiaries, such as Lehman Brothers and Lehman Re.'⁶⁵

Such news was hardly shocking before September 2008. Thanks to high returns on the financial markets, financial derivatives became extremely interesting not only for asset management, but also for the alternative risk transfer of reinsurance companies. From the moment it was incumbent on reinsurance companies to pay more attention to the share price than to building up undisclosed reserves, and regulators, rating agencies, investors, and savers insisted on transparency everywhere, they were no longer able to withstand the pull of the financial markets. Those who did not participate were quickly accused of failing to recognize the signs of the times, to have their head in the sand, and to need a wake-up call. They were missing out on lucrative returns. Equally, they had to put up with the question of why banks should not invest in the business of an industry that was familiar with all the possible forms of global risk.

It is thus not surprising that the insurance of extremely rare and particularly high risks makes the reinsurance industry more a part of the financial sector which for a long time has concentrated on futures, options, and derivatives. This is illustrated by the asset-backed securities which FIFA used in 2006 to insure their investments in the World Cup in Germany against a terrorist attack or a natural catastrophe. Investors in these securities had chosen their placement wisely.⁶⁶

5 HARMONIZATION

More surprising than the convergence and continuing orientation towards the financial market is the reinsurance trend that followed 9/11. This only drew public attention after the global financial crisis of 2007 and 2008. All those who, given the rapid growth of the

⁶⁴ Sequist 2006, 32.

⁶⁵ Ross 2002, 16.

⁶⁶ Laster and Schmidt 2005, 38.

financial markets, had expected for some time either the end of organized capitalism or the final victory of pure market principle with the simultaneous convergence of all financial service providers,⁶⁷ must have been fundamentally unsettled. Instead, a process of re-regulation began to emerge in the financial sector at the onset of the twenty-first century. Even if the vague term 'harmonization of standards' was used for this and some standards were loosened rather than specified or even intensified, it could be observed that regulators were more attentive than generally assumed: 'From Hamilton to Munich, there is growing consensus among governments and regulators that there is a need to harmonize standards across financial industries. Reinsurance as an important financial service, sticks out like a sore thumb in this respect,' reports *The Review*, expressing concern about intentions to regulate global reinsurance on a global level.⁶⁸

Since 1994, the International Association of Insurance Supervisors (IAIS) has been developing guidelines, which in 2004, after ten years of debate, still had the potential to be a large global regulatory standard.⁶⁹ At the end of 2005, the Reinsurance Directive of the EU was passed.⁷⁰ However, neither EU directives nor those of IAIS or bank-specific rules (Basel II) or the work on new solvency criteria for insurance (Solvency II) could have prevented the catastrophe in the financial industry. Asymmetrical incentive systems at banks and the loss of basal risk distribution mechanisms in the insurance industry, which are essential for every type of financial service provider even for the most sophisticated valuation methods, were hardly banished by this regulatory framework.

However, there were serious attempts by national regulators before the financial crisis to create a more sustainable form of market coordination for the global markets. Indeed, the Institute of International Finance (IIF) as the representative of the global financial industry after 2008 was only able to counter with a catalogue of *best practices*. Josef Ackermann, the chairman of the IIF, made clear at the presentation of the report that this should not be misunderstood as a chance to self-regulate, but as a contribution to the necessary reforms to the regulatory framework, saying: 'This report is not intended to be an exercise in self-regulation. We recognize that it is essential for the industry to reform and that there is an emerging consensus on the benefits of reinforcing these efforts through effective regulatory incentives and structures.'⁷¹

⁶⁷ For an early example of the alleged end of organized capitalism see: Lash, S. and Urry, J. (1987), *The End of Organized Capitalism*, Madison, WI: University of Wisconsin Press.

⁶⁸ Ion 2003, 30. See also Skipper and R. W. Klein 2000.

⁶⁹ Since 2004 *The Reinsurance Transparency Group of the International Association of Insurance Supervisors* has published reports on the global reinsurance market and its financial stability. They can be interpreted as an early contribution to macro-prudential supervision of the industry. The long-term goal, however, was to harmonize the global regulations. See International Association of Insurance Supervisors 2004.

⁷⁰ Reinsurance Directive 2005/68/EC of the European Parliament and Council of 16 November 2005. Available at: <<http://eur-lex.europa.eu>>, accessed 28 June, 2013.

⁷¹ Institute of International Finance 2008, Press bulletin, 'Global Finance Leaders Release Comprehensive Proposals to Strengthen the Financial Industry and Financial Markets', Washington DC, 17 July 2008. On the report, see Institute of International Finance Board of Directors 2008.

The reinsurance industry was also shaken by the financial crisis.⁷² Unlike most previous crises in the reinsurance business, the problems did not originate on the technical side of the business, but rather in what was traditionally deemed to be the somewhat well-to-do investment side. However, this investment side for some time not only had to offset and stabilize the reinsurance-related core business. It had become 'more technical', more dominant, and certainly riskier, plunging it into a hectic operational maelstrom.

The industry's situation differed quite substantially from that of previous turmoils in one aspect. In a consolidated market, they could have done without further differentiation in the organization of the industry. For this reason, there were no other sources of security in the great financial crisis other than the convertible bonds within the industry and industry guidelines, which were developed by internationally networked regulators far away from the reinsurance business. However, the return to core business began making use again of the differences between banks, insurers, and reinsurers and began reflecting these differences in statistics and tables.⁷³

⁷² The Geneva Association 2010.

⁷³ 'The business model of insurers is fundamentally different from that of banks': Frey and Karl 2010, 1. See also the outlook of Vec 2014 and the 'Differences between Banks and Insurers', Frey and Karl 2010, 5, Table 1. This table shows the difference between banks and insurers according to the criteria *liquidity risk, capital buffer, contagion risk, unwinding process*.

CHAPTER 10

CONCLUSION

THE independent business of reinsurance never developed into a powerfully organized industry. Yet the question regarding organization and changed risk situations of the industry runs like a common thread through the history of reinsurance. As abstract as the products of reinsurers may have been, the problems were concrete when it came to organizing the distribution of current risks. Wherever new procedures were found for this purpose new difficulties arose in explaining the concept with regard to the associated forms of cooperation and competition. Reinsurance is not a matter of course and has always had to be explained anew. In this process, the industry representatives contemplated contemporary risks and insurance-related issues just as much as how they could mobilize their partners and control their competitors. At the same time, the history of reinsurance is also the story of the risk of distributing insured risks and the story of untiring efforts to work on the identity of the industry between the two poles of cooperation and competition.

The industry can only be understood by taking seriously its many attempts at self-interpretation and by contextualizing it historically. To this end, the 150 years since the foundation of the first independent reinsurers were founded can be roughly divided here into three phases, each with its own organizational characteristics and treatment of risk.

Reinsurance first had to create its own area of activity in a long first development phase between 1860 and 1960. The first articulated attempts to gain independence were a response to the growth problems of the insurance industry in the industrialization and urbanization process of the nineteenth century. It had to be ensured by any means that a reinsurer could sign agreements with several direct insurers and in various lines of insurance. Only then was it possible to distribute risks and to avoid one-sided dependence in agreements or underwriting too many similar risks. Early coordination efforts between the various reinsurers were unsuccessful. But toward the end of the nineteenth century, the situation became somewhat more transparent insofar as umbrella organizations and legally sanctioned cartels began to be established in many sectors of the direct insurance business and the premiums in insurance evolved into more standard, stable

structures. The first large wave of reorganization in the history of reinsurance was thus paradoxically linked to the industry-wide organization of the direct insurance business.

Reinsurance risks can be distributed in numerous ways—between various clients, markets, locations, and over time. For this reason reinsurers tried early on to internationalize their business. They enjoyed relative success in continental Europe, but the transatlantic business came under threat from the big earthquake in San Francisco (1906). This trial by fire not only brought the industry to the verge of ruin, but also to its first attempts at transnational coordination of policy text. The return to international and transatlantic business took place with much clearer insight into the functioning of international markets. This is likely to have been the prerequisite for facing the massive de-globalization wave of the 1920s and 1930s. The associated challenges in international payments, for example, were overcome on an organizational level: through building corporations, systematic networking via retrocession and the aid of pools built for the distribution of large risks. An important innovation in the reinsurance treaty, the slow transition to a non-proportional reinsurance and actuarial, non-trivial excess-of-loss agreement, pushed the industry after the Second World War to the limits of technical self-understanding. The first meeting of representatives of reinsurance was held in Monte Carlo in 1957, and has been held every year since.

The second development phase in the history of reinsurance took place between 1960 and 1980. It was marred by structural problems. In the era of mass consumption structural problems were caused by the high demand for insurance of small risks (motorization) and the special need for insurance of major technological risks (nuclear energy or aviation). The reinsurance industry found itself in an assessment crisis, particularly as it was unclear as to why it continuously produced deficits on the technical side. Even in times of stable economic growth, these deficits could only be offset by the high interest rates on investments. At the same time, the industry was confronted with completely new limits in insurability. Statistics failed in their assessment of the risks that new technologies presented. Inflationary tendencies impacted the liability business, in particular. The industry reacted with the long-standing, systematic construction of cross-company infrastructures of expertise, and individual companies tried to secure their business through vertical integration, including acquiring direct insurance companies and continuing to expand the corporation. The result was new publication entities. Insurance-related economic research institutions were founded and staff recruited, with a mathematical, science, or engineering background. Whilst reinsurers like to see themselves as the bastion of economic-political liberalism between the Scylla of nationalization and the Charybdis of the coinsurance system, they distanced themselves during this phase from the productive fiction of independence and competition. Coordination attempts between companies were no longer limited to retrocession and pool-building, but were expanded to encompass market reports and statistics.

The early internationalization of reinsurance made it easier for reinsurers to react to intensified competition and the global trend toward liberalization of all markets through *mergers and acquisitions*. This is where the third phase began. This corporate concentration process at the end of the 1990s made further organizational differentiation

unnecessary for reinsurers. Reinsurers were required to get involved with the financial markets for asset management and the new developments in alternative risk transfer. It seemed to confirm the assumption that the world of financial service providers would no longer be divided in future into a department for savings deposits and credit on the one hand and a department for insurance policies and risk distribution on the other. There remains some irony in the fact that reinsurance was faced with transnational pressure to regulate what used to be self-regulation, even though it had largely forgone cross-company organization at the height of the liberalization wave at the beginning of the twenty-first century. Through their long history reinsurers had learnt to explain what made them different from direct insurers and from state-owned monopolies, but now they had to remind themselves what the special differences are that distinguish the banking business from reinsurance. At the same time they had to be mindful of the fact that they were regarded as economically important, but not systemically relevant and that they could preserve their independence. Now the focus shifted to organizing themselves within companies and the industry in such a way that their solvency could be verified at any time. This process of verification would be done by investors and shareholders, by clients, the authorities, and their competitors.

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ABBREVIATIONS USED IN FOOTNOTES

AssJb	Assekuranz-Jahrbuch, Vienna
Magazine	Swiss Re Magazine
NZV	Neumann's Zeitschrift für Versicherungswesen, Berlin
SRCA	Swiss Re Company Archives, Zurich
<i>The Review</i>	<i>The Review</i> , London
VW	Versicherungswirtschaft, Karlsruhe
Wallmann's	Wallmann's Versicherungszeitschrift, Berlin

Reinsurance is an invisible service industry which enables insurance companies to insure more risks and to make better use of their resources. Until recently, reinsurers were only known to a small minority outside the insurance community. Major disasters, especially those caused by natural catastrophes, have increasingly brought the industry into the spotlight. Yet what is perceived today by a wider public still only represents a fraction of the industry, and the mechanisms of reinsurance to deal with global risk exposure are virtually unknown. *The Value of Risk* provides an overview of how today's reinsurance industry developed. It investigates for the first time the role of reinsurers in a changing risk, economic, and market environment.

Harold James explains the fundamental principles of insuring and outlines the evolution of the industry in his introductory essay. In Part I, Peter Borscheid describes in detail the global spread of modern insurance, which emerged in the late eighteenth century amidst ideas of rationalism, which attempted to quantify risk in monetary terms, the setbacks it encountered, and how the market environment changed over time. Professional reinsurance emerged with the rise in insured risks in the industrializing mid-nineteenth century. By the time the San Francisco Earthquake occurred in 1906 the reinsurance industry had become well established and showed a remarkable ability to deal collectively with the catastrophe. David Guggerli describes in Part II how the industry as a whole dealt with such challenges, but also the numerous exposures to a changing risk landscape. Against this background, in Part III Tobias Straumann examines the history of the Swiss Reinsurance Company, founded in 1863, providing a fascinating example of how professional risk taking was developed over the last 150 years.

Cover image: Swiss Re London's headquarters on
30 St Mary Axe. Architecture by Norman Foster.

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