Document generated on 04/30/2024 8:25 a.m.

Assurances et gestion des risques
Insurance and Risk Management

Back to the Past
Retour vers le passé

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Volume 81, Number 1-2, 2013

Numéro spécial sur l'histoire de l'assurance

URI: https://id.erudit.org/iderudit/1091795ar
DOI: https://doi.org/10.7202/1091795ar

See table of contents

Publisher(s)

Faculté des sciences de l'administration, Université Laval

ISSN

1705-7299 (print)
2371-4913 (digital)

Explore this journal

Cite this document

Outreville, J. (2013). Back to the Past. *Assurances et gestion des risques / Insurance and Risk Management*, *81*(1-2), 9–17.
https://doi.org/10.7202/1091795ar

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Back to the Past / Retour vers le passé[1]

J. François Outreville

1. INSURANCE AND RISK MANAGEMENT

Insurance is a story as old as time. Long time before Christendom, around the Mediterranean Sea, Phoenicians merchants traded goods and wheat and were actively engaged in risk management practices. Legend even says that Chinese merchants travelling through the dangerous waters of the Yellow river were aware of the basic principles of risk management. Risk management was born in what could have been a barter economy and expanded with the complexities of modern economies.

Even if it has deeper foundations, risk management, as it is practiced today, is essentially a post-1960s phenomenon.[2] For practical purposes, the emphasis of risk management was originally on pure risks and the original function of risk management was insurance buying. Although insurance is still widely used, large organizations have discovered that insurance did not meet all needs to control the impact of risk and uncertainty on the organization. A study of the history of risk management is therefore useful in tracing the development of the relationship between insurance and risk management. At the same time, light might be shed on the areas of disagreement about the scope of risk management. The first paper in this issue by *G. Dionne* reviews the recent development of risk management practices and applications to financial markets in light of the events preceding the recent financial crisis.

2. THE DEVELOPMENT OF MATHEMATICAL CONCEPTS

Credit for the development of actuarial science belongs to Blaise Pascal in his correspondence with the mathematicians Pierre de Fermat and Christiaan Huygens in the 1650s. He established the basic theorem of probability by counting all of the alternatives in equiprobable situations. In 1713, the basis of the modern mathematical probability theory developed by Jacob Bernoulli in "Ars Conjectandi" is published (eight years after his death) in Basle. In 1738, Daniel Bernoulli published his answer to the game known as the St. Petersburg Paradox.

His approach led to the concept of utility. It is surprising that economists did not apply the ideas of Bernoulli on risk aversion and expected utility before it had been proved as a theorem by Von Neuman and Mortgenstern in 1947.[3]

Although games of chance appear to be as old as man, it is surprising that the mathematical concepts of probabilities only developed in the 17th century. Several tentative explanations have been offered, none of which is entirely satisfactory.[4] It has been argued, (1) that mathematical probability theory may have developed in response to the specific needs of the mercantilist economists, (2) that prior to the 17th century mathematics were not sufficiently conceptualized, (3) that it corresponds to the emergence of a modern scientific approach in all the fields, and (4) that it is linked to the evolution of the Catholic Church which prohibited usury until the 16th century.

The remarkable story of risk and uncertainty touches on the most profound aspects of psychology, mathematics and statistics. Bernstein in *Against the Gods* follows the intellectual development of risk management and how people throughout the centuries have changed their views of what constitutes risk and how risk can be mitigated.[5] The conceptual link between insurance and risk has been subject to a fair amount of study in the academic literature. In this issue, *Eeckhoudt and Gollier* underline some little known links that exist between fundamental papers in the economic theory of risk. To this end they follow a chronological order from Bernoulli to Rothschild-Stiglitz.[6]

Although the idea of risk may be difficult to conceptualize, risk is of considerable importance for the functioning of all economies and economic agents. The concepts of risk aversion, prudence and cautiousness have interpretations for agent's behavior in financial and insurance markets. The relationship between these concepts has become an important issue in the recent years to understand the complementary role of governments and private insurance markets to deal with the complexities of modern economies. The paper by *Eeckhoudt* and *Spaeter* reviews these issues.

3. INSURANCE AND ECONOMIC DEVELOPMENT

The basic concepts and the structure of the insurance industry and markets can be similarly explained in terms of the evolution of this industry as a response to new events. The development and expansion of the insurance industry are attributable to the major influences

of international trade, urbanization, the development of catastrophic events like fires and the industrial revolution.

For historic reasons, the insurance industry developed and flourished in Europe from the seventeenth century onwards. England is often considered as its birthplace but this has been challenged by several authors. The evolution of insurance in North America and other colonies of the United Kingdom is marked by the establishment of agencies of the major English companies and by the adaptation of English practices to a very different environment. Similar patterns of development followed in French, Dutch and Spanish colonies. Two papers in this issue by *B. Venard* (the French insurance sector) and *R. Alemany and M. Guillén* (the Spanish insurance sector) provide support for this development pattern.

3.1 Insurance and the relationship to trade

The Code of Hammurabi (1780 B.C.), which formalized the concepts of civic responsibility, bottomry and respondentia, improved trade conditions and established doctrines that were to play significant roles in the evolution of insurance.[7]

During the time of the Greek area of modern history the contract of bottomry was established by Demosthenes (The Orations) with premium rates depending upon factors such as time of the year, the type of vessel, the route followed, the experience of the company. The Greek tradition in insurance was adopted by the Romans, but the decay of the Roman Empire led to the development of agrarian societies, based on small communities living in autarky. The revival of international trade, after the Middle Ages, may be due to the Scandinavian's trading activities which included most of Europe and the Middle East. The merchants of the Hanse cities organized a league to protect trade routes and to enforce strict codes of conduct. Until the seventeenth century, the Hanse merchants had sovereign status in the City of London. In the year 1310 it is recorded that the Duke of Flanders granted a charter for the establishment of a Chamber of Assurance to underwrite marine risks.

The development of insurance is also credited to the bankers and merchants of Northern Italy. The Lombard merchants engaged in international trade established a league for common protection and began developing marine insurance coverages in the city of London towards the end of the twelfth century. Bottomry agreements were common in Venice, Genoa, Florence, Naples and Bari before the year 1000. By 1400, Europe's trade pattern was well developed and it is

probable that the insurance activity developed at the same time and for the same reasons in the northern part of Europe and in Italy.

During the fifteenth century the patterns of trade became international and Portugal became the leading trade country in Europe soon followed by England, France, Holland and Spain. Spain conquered Portugal in 1581 and added Antwerpen (Anvers) and the Netherlands to its domain by 1585. The defeat of the Spanish Armada in 1588 left the field to the Dutch, English and French. Over the next two hundred years, England established authority over all of Europe as a dominant nation in international trade and helped the City of London to become the world center in the marine insurance field. Today, the world's best known insurer remains Lloyd's of London but the operations have evolved since 1688 when Edward Lloyd opened the Lloyd's Coffee House. In this issue, *R. Moreau* reviews the historical development of this world's leading market for specialist insurance.

3.2 Insurance and the industrialization process

As industrialization gave rise to the development of urban centers where wood construction predominated, it also generated high losses when fires occurred. While a farmer could rebuilt a damaged home with the help of the community, the complexity and impersonality of cities resulted in catastrophic consequences for the owners. The Great Fire of London in 1666 is always given as the catalyst event for the development of fire insurance. Several fire insurance companies were formed shortly after the fire. Fire marks were issued by these companies and affixed to the insured buildings, so that in the event of a fire these buildings could be identified and protected by the fire-brigades: no fire marks, no protection.

Disastrous fires in Copenhagen in 1728, Hamburg in 1842, created an awareness of the need for the same kind of protection. Fire insurance was still in its infancy when it was transplanted to America. In 1752 Benjamin Franklin organized and promoted the Philadelphia Contributionship for the Insurance of Houses from Loss by Fire. It was modeled on the Amicable Contributionship, known as the Hand-in-Hand Office in London, and adopted its name, plan, seal and badge: four hands clasped.

In North America, the "New Orleans" was the first steamboat to run from New Orleans to Pittsburgh at the beginning of the 19th century followed by the development of railroad transportation. Steamboat and train accidents soon became common and opened a new field of activities for insurance companies. In 1849 the Railway Passenger Assurance Company had been founded in London to provide

insurance against injuries resulting from railroad accidents and it was followed in 1863 by the establishment of the first insurance company in the United States to sell accident insurance, The Travelers Insurance Company of Hartford.

Casualty insurance developed during the nineteenth century. Until the 1850s no company would underwrite a policy covering windstorm or theft. By the end of the century specialized insurance business for industrial and commercial risks had been established. In 1865, the first contract for breakage of glass was subscripted with the Guardian Plate Glass Insurance Company in Dublin. In 1866, the Hartford Steam Boiler Inspection and Insurance Company is the first company to insure against Boiler and Machinery breakdowns.

The introduction of railways and mechanically driven machinery increased the risk of loss of property and of bodily injuries. It is interesting to remember the early opposition to the automobile by the public in Europe as well as in North America. The first automobile insurance policy was written about 1888 as an extension of the forms used for the protection of owners of horse drawn carriages. By the end of the century automobile insurance had just began its long and rapid history of growth.

The development of professional reinsurance services may be credited to the increasing growth of fire insurance business following the industrial revolution. The surge of reinsurance was also motivated by the need for larger pools of insurance exposures and vulnerability to the frequency and severity of claims. Cologne Re (today part of Berkshire Hathaway) is the oldest reinsurance company established in 1846. Munich Re was established in 1880 and Swiss Re in 1863. In this issue, *P. Thourot* reviews the recent developments in reinsurance activities.

4. INSURANCE AND THE ROLE OF GOVERNMENTS

It is mainly during this last century that insurance became an institutionalized activity. The evolution of insurance business has brought it from a mere set of conventions between individuals to a major national concern in all the countries. The most important development has been in all countries the increasing involvement of governments. Not only governments introduced intensive regulation but also became insurers when the protection of the public interest became a matter of social concern.

4.1 Government intervention as a regulator

The first important wave of regulation targeted the insolvency problem by requiring that insurance companies file reports of their financial status. The State of Massachusetts required some reports as early as 1799 and New York adopted a reporting law in 1828. Reporting requirements had little impact on the solvency of insurance companies and failure of insurance companies gave rise to a demand for administrative regulation.[8]

Elizur Wright, often called the father of insurance regulation, lobbied the Massachusetts legislature to require that life insurance companies maintain policy reserves. He became the first Insurance Commissioner after the state of Massachusetts created an Insurance Board in 1855. The status of insurance regulation in property and casualty insurance at the turn of the century was still rudimentary. Most insurance commissions were small. Insurance regulation focused on reporting requirements, licensing of agents and companies, and prescribing policy forms.

The major reform of the life insurance industry began as an intra-company dispute involving Equitable Life. The Armstrong Investigation Committee conducted in New York found insurance company abuses in all facets of the life insurance business and the 1906 report further raised the steps for life insurance regulation. In the fire insurance business, investigations of the insurance companies were conducted in some ten states after the San Francisco fire of 1906. In New York, the Merritt Committee established in 1910 concluded that collaborative ratemaking was needed because each individual firm lacked sufficient data to set fire insurance rates. It recommended the establishment of rating bureaus to make rates for fire insurance companies.

At the same time in Europe, politicians were taking the same steps towards more regulation of the activities of the insurance companies. In Switzerland, Numa Droz supported the law establishing the principle of insurance surveillance in 1885. But it was not until the beginning of the century that insurance boards were established in Germany (in 1901) and in France (in 1905). The British insurance tradition had always been one of self-regulation and remained prevalent until the Second World War.

4.2 Government intervention as an insurance carrier

As early as the 1850s, the Government of Prussia had in fact organized a system of benefit funds providing against sickness and

death (the Prussian Industrial Code of 1845). Under the leadership of the Reich Chancellor Bismarck a first Accident Insurance Bill was proposed in 1881. A Sickness Insurance Bill was promulgated in June 1883 and the first compulsory Accident Insurance Law was that of July 1884 relating to mines, shipbuilding yards and factories. It became law as the Old Age and Invalidity Insurance Act on June 1889.

At the same time a series of disastrous mine accidents in Great Britain resulted in the adoption of the Coal Mines Act of 1872 on general safety rules. The increasing number of occupational injuries despite the requirements of the safety and health regulations resulted in worker's compensation laws to indemnify injured workers in Germany (1885) and in Great Britain (1897).

Government involvement in social insurance activities is probably more significant in its impact on the insurance business than any other event during the first part of this century. Although initially designed to provide a basic minimum economic security, the concept of Social Security quickly expended into a relatively comprehensive system.

4.3 Is there a role for insurance in the development process?

Insurance, like other financial services, has grown in quantitative importance as part of the general economic development. The protectionism was considered a macroeconomic tool and as such used by governments to produce not only insurance services but also social and macroeconomic outputs. However, owing to the great diversity in the political, economic and social environment in which insurance markets have evolved, and the historical factors that have influenced the character of insurance in each country, it is not surprising to see that insurance markets especially in developing countries have their own characteristics.

There are several ways in which insurance services contribute to economic growth: by (1) promoting financial stability for both households and firms; (2) mobilizing and channeling savings; (3) supporting trade, commerce, entrepreneurial activity, and social programs; and (4) encouraging the accumulation of new capital and fostering a more efficient allocation. Structural, financial and technical constraints such as undercapitalization, the small size of markets and the lack of sufficient experience and know-how limit the capacity of insurance markets in developing countries. In their paper, *Kamega and Planchet* provide one example based on the development of the life insurance market in the countries of Sub-Saharan Africa.

5. IN QUEST OF BEHAVIORAL INSURANCE [9]

Recent sociological and historical work by Ericson and Doyle [10] explain how insurance risks very often are not reliably calculable, although the risk has already been transformed into an all-too-measurable loss. Insurance is an "uncertain business", characterized by competition for premiums that pushes insurers into the unknown and the performance of insurance market, is affected by the presence of anomalies that may affect the risk-taking behavior of agents and the optimal allocation of insurance in the economy.

At the beginning of the XXth century, Willett [11] and Knight [12] discussed several biases in human decision-making and described features of risky choice that were to become key components of situations in which insurance markets can operate smoothly and situations in which insurance markets would collapse because of moral hazard and adverse selection. These issues have received considerable attention in the literature and are particularly relevant for insurers. Determinants of risk attitudes of individuals, emerging from the field of behavioral economics, are of great interest in insurance research to better understand risk tolerance, risk behavior and insurance purchases or the role of proper disclosure of information. The field of behavioral insurance will certainly become a growing area in the future volumes of *Assurances et Gestion des Risques / Insurance and Risk Management*.

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Pfeffer, I. and D.R. Klock (1974), *Perspectives on Insurance*, Prentice-Hall (Englewood Cliffs, N.J).

Notes

1. This editorial is largely inspired by the books of Pfeffer and Klock (1974) and Outreville (1998).

2. See an earlier paper by Crockford, "The Bibliography and History of Risk Management," *The Geneva Papers on Risk and Insurance*, 7 (No 23, April 1982).

3. Karl Borch relates the lack of interest of Walras or Marshall to the Daniel Bernoulli principle and its implications in his late book: *Economics of Insurance*, Amsterdam: North-Holland Publishing Co., 1990.

4. A discussion of the history of risk analysis is presented by Covello, V.T and J. Mumpower, "Risk Analysis and Risk Management: A Historical Perspective," *Risk Analysis,* vol. 5(2), 1985.

5. Bernstein, P.L. (1998) Against the Gods, the Remarkable Story of Risk, New York: J. Wiley and Sons.

6. Rothschild, M. and J. Stiglitz published two papers in the *Journal of Economic Theory* in 1971 and 1972 but the most famous contribution to insurance economics remains their paper published in the *Quarterly Journal of Economics* in 1976.

7. Bottomry and Respondentia loans were maritime contracts on vessels (bottoms) and on cargos (res).

8. After the great Chicago fire of 1871 and the Boston fire of 1872 only 1000 of the 4000 existing insurance companies survived. See Pfeffer and Klock (1974).

9. This title is borrowed from Outreville, J.F. (2010), "The Geneva Risk and Insurance Review 2009: In Quest of Behavioral Insurance," The Geneva Papers on Risk and Insurance 35, (484–497).

10. Ericson, R.V. and A. Doyle (2004) *Uncertain Business: Risk, Insurance and the Limits of Knowledge*, Toronto, Ontario: University of Toronto Press.

11. Willett, A.H. (1901) *The Economic Theory of Risk and Insurance*, New York: Columbia University Press, Reedited in 1951 by the University of Pennsylvania Press.

12. Knight F. (1921) *Risk, Uncertainty and Profit*, University of Chicago Press.