TERRORISM IMPACT ON INSURANCE INDUSTRY

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Abstract: *Terrorism is a more and more discussed topic. All over the world common people and experts talk about victims, casualties and physical damage. What about economic effects? Not only in terms of costs, but also regarding how terrorist acts affect different branches of the economy. Before 2001, September 11th insurance industry did not think about taking into consideration terrorist risk and assess them accordingly. In financial terms, does this industry gain or lose? In the following work a few issues regarding these questions might be answered.*

Key words: terrorism, terrorist attacks, insurance industry

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Introduction

Because of a concurrence of heightened potential degree of highly associated risks and crescent inconsistency, nowadays terrorism is one of the most provoking risks for insurances and reinsurances providers in the last century.

Insurability is a changing notion. A lot of risks thought as "impossible to insure" for years are these days part of the insurance industry, which has been steadily enlarging the limits of insurance coverage as a consequence of the appearance of new risks and market request. Along the years, the list of risks that may be insured has enlarged, to cover new reasons; "some have been of economic nature, such as credit insurance, and some of a political one, such as expropriation of assets by the government, public nuisance or terrorism". Though, technological and legal frameworks' development (and particularly the liability regimes), demographic variances and urbanization, climate change, the evolution of the geopolitical background and now new types of terrorism, encounter insurance providers with risks of uncommon dimension and complexity which severely put the limits of the market to test.

Criteria of insurability

Private insurance operations are based on a number of conditions, which could be summarized as follows:

- **Accessibility**: the probability and seriousness of damage must be measurable;
- **Randomness**: the moment at which the insured event might occur should be impossible to predict and the occurrence itself must be free of the insured's will;
- **Mutuality**: lot of persons exposed to a certain hazard must reunite to form a community of risk within which this is shared and diversified;
- **Economic feasibility:** for a risk to be insurable, private insurers should be able to charge a premium balanced with the risk it should cover (the "justified premium"). For the insured to be able to get the cover he needs (if insurance is

not compulsory), premia must be fair both for the insurance provider, who will determine whether it allows the insurance supplied to be profitable under certain capital limits, and for the insured, who wants to find it affordable and proportionate with his own vision on the risk.

Risks that would not meet these criteria may be treated by professional risk carriers as uninsurable and, thus, coverage may miss on the private market. It should still be kept in mind that regulatory and legal limits are other key factors figuring the goal of insurability, although this article will emphasis more the technical criteria of insurability.

Obviously, new forms of terrorism risk do not necessarily meet all of the criteria mentioned above. Given its potential dimensions, it is commonly considered that new forms of international terrorism share certain insurability issues with other extreme hazards (natural calamities and large-scale technological risks). Notwithstanding, the assessment of new forms of terrorism risk for insurance goals has supplementary difficulties which have their origins in a mix of extreme loss potential and severe risk unpredictability or ambiguity.

New loss magnitude, high risks correlation, insurability issues of hazard risks

In the context of the events of 9/11, it is now accepted that new forms of terrorism may lead to results of catastrophic dimensions. There is also a high relation between the risks insured – another characteristic that is common with other types of large-scale disasters. These characteristics show off obvious obstacles to insurability.

Increase in loss dimension

Terrorism risk was not identified as a potentially disastrous risk until 2001. Isolated menaces posed by nests of national or regional terrorists and also international terrorism acts were of *relatively* small magnitude and that is why, except in very few states, that were most exposed to terrorism, coverage was not an issue.

The 9/11 attacks have however brought out into open the **radical modification in the scale of possible losses.** To take the full dimension of these attacks, it should be emphasized that the brought about USD 31.7 billion insured losses are almost 1.5 times higher than the insured losses from Hurricane Andrew, the second most expensive event in the insurance industry. The balance between September 11 losses and those produced by former terrorist attacks shows up the gap in historical array on terrorism losses: the worst terrorist act in terms of insurance until 2001 was the explosion of a bomb near the Nat West Tower in London, which resulted in USD 907 million. The 2001 events have consequently called for a complete reevaluation of loss scenarios for possible future attacks. Models of second terrorist attacks nowadays include *Probable Maximum Loss* (PML) considered as useless in the past; scenarios in which total insured damage could get over USD 250 billion are considered presumable by experts.

This modification in dimension is originated in a **switch in the interests of terrorists**. Some terrorist organizations have stated their enemy to be, no longer just national or social actors, but the community of Occidental industrialized states and their values. Terrorist groups now look for not only to point up their cause, but also to maximize casualties, the amount of victims and collateral damage, and do not dither to sacrifice their own lives to increase to maximum the shock of attacks. **Modus operandi** of nowadays terrorists allows for exponential damage as well, at low cost for the terrorists: they bear to form loose, cross-border organizations and partnerships based on religious, ideological and political leaning, often declaring that their destructive acts are part of a large global plan of

war against a common enemy. In this way, they entail a force-multiplier effect by establishing relations with other organizations around the world.

Moreover, new technologies, the development of global networks and dependencies between nations have seriously **grown up terrorists' potential** to organize and to deal damage, including through simultaneous attacks or sudden propagation of damages.

A major step forward lies in the **exploitation of critical infrastructure** (transportation, water supply, energy, communications, etc.) by terrorists in recent acts. The increased dependence of social and economic life on the operation of networks, combined with increasing interconnectivity between them at national and international level, renders into a set of vulnerabilities associated with their potential break down, generating sever disruptions.

Networks might be aimed by terrorists: by their nature, networks interface with public activities at many meeting points and so offer relatively unlimited possible targets to attack. For instance, it is hard to guard rail lines or all rail cars. Furthermore, parts of the network may not only be considered as a target but also used as a mean of attack. The use of airplanes to destroy symbolic buildings in the 9/11 attacks is an accurate example of this strategy. The Madrid bombing in 2004 followed the same pattern. Finally, terrorists may take benefit of the diffusion capacity of large critical infrastructure. In October 2001, terrorists used the US postal services to widely spread anthrax poison. These types of small but carefully aimed attacks might cause immediate large scale economic losses. No matter the strategy adopted, the damage is all the greater that every element of infrastructure – every aircraft, train, or piece of mail – becomes a potential target or a potential mean of attack, putting the whole network at risk. This will demand for big scale security measures, which may cause major economic ruptures: for example, after the hijacking of several planes on 9/11, the unknown data about the total number of planes targeted caused the shutting down of the entire US commercial airline system one hour after the first attack on the World Trade Center, for the first time in history.

Also, the potential use in the future of **non-conventional chemical, biological, radiological and nuclear (CBRN) weapons** and weapons of mass destruction should not be forgotten. Since the mid-'90s in particular, terrorism experts have been signaling that terrorists may have got greater access to far more efficient and lethal weapons.

Aftermaths for insurability

Because of those presented above, the 9/11 attacks may reveal not to be an isolated event, and the probability of other attacks of disastrous proportions has to be taken into consideration. In this respect, it may be stated that new forms of terrorism share the characteristics of risks often called as **LPHC (low probability high consequences) events**. Policymakers and private sector actors are all aware of the basic insurability issues that come up in the general context of disaster insurance and that have been largely analyzed in relation to natural hazards in particular. First, terrorist attacks and natural disasters as well result in damage that are potentially big and very improbable. The procedure for assessing the probability that a certain level of damage will be overpassed during a given timeframe has evolved from a rather simple deterministic basis to a more complicated methodology based on damage exceedance probability (EP) curves, generated using specific catastrophe modeling software. For LPHC events yet, analysis of past events acknowledge wide fluctuations in damage distribution; this impedes insurers' ability to forecast the seriousness and frequency of future events, and so to establish premia balanced with such risks.

LPHC events also inflict a serious financial challenge: to reimburse for such events, the (re)insurance industry should be able to assemble very large financial resources in a short timeframe. The appreciable dimension of potential damage is to be evaluated against the

available extent of private insurance to cope these losses. The financial assets of the insurance market trust in three main sources: a) the capital and reserves owned by insurers and the amount of new capital that they can gather immediately; b) the capital and reserves owned by the global reinsurance network and its possibility to gain new capital; and c) part of the short-term cash flow from new activities, since after a very large damage, insurance quotas tend to grow up sharply for a period of time.

Being obliged to cover relatively rare, but seriously large losses that can have severe long-term economic and social effects, companies underwriting disaster risks must own **very large amounts of capital and reserves or have easy access to substitute financing source**. If disaster insurance is given without access to the necessary quantity of capital, then the professional risk carrier faces a serious bankruptcy risk (also known as the risk of ruin), so that frustrating the very purpose of insurance operations. Insurance companies can – and often do – bypass this risk simply by disengaging from the disaster insurance market.

The 9/11 terrorist attacks were the opportunity for market players to remember that, while the burden of insurers, backed by international reinsurance markets, was very big, it was also limited. Evaluating the industry burden and its ability to support a certain amount of damage is a difficult exercise. A study was carried out in 2002 on the capacity of the US industry to refund for losses resulting from natural calamities. It concluded that a USD 40 billion damage would probably be feasible, while a USD 100 billion loss would end up in a large number of insolvencies and seriously disturb insurance markets. On the global scale, it is enough to say at this moment that after 2001, the heavy damage suffered by the insurance and reinsurance industry (reinsurers finished up covering about 70% of insured damage), together with the very substantial capital markets plunge, resulted in an evaluated capital loss of USD 200 billion for the global property and casualty (P&C) insurance and reinsurance industry.

High risk correlation

Another common characteristic of terrorism attacks and natural catastrophes is that they usually inflict **temporally and spatially connected risks**. Risk correlation does not permit to insurers to take benefit of the law of large numbers. This deters geographical and time diversification, and makes it difficult to build an equilibrated book of business. Because insurance is affirmed on the blend of a large number of significantly independent risks susceptibilities, failing to accomplish this target, while not necessarily switching to uninsurability, will demand increased ability/higher premia to face risk concentration. A connected issue is that of **risk of accumulation:** the same disastrous event can cause damage involving many different insured properties and networks at the same time, giving birth to overcoming claims burdens in a single policy period. The serious boost in the concentration of population and economic wealth around the world has considerably raised the risk of correlation and accumulation in recent times. The insurance industry has recently signaled against the unequal exposure and vulnerability of quick growing megapoles to natural, technological and environmental calamities, as well as to terrorist attacks. It should also be emphasized that the **big differences in disaster exposure**, adding to risk correlation, makes mutuality even more difficult to acquire. For example, coastal areas and earthquake prone regions, or landmark or "trophy" risks such as, symbolic buildings, and major metropolitan areas, will be much more unprotected against natural calamities or terrorism attacks respectively than other areas, and will be more probable to be insured, generating ongoing imbalance in risk portfolio.

Furthermore, one of the lessons of 9/11 was that large-scale events may also turn into a **high level of correlation between different lines of insurance coverage**. Not only profit-making property, but also business blackout, aircraft accountability, workers' allowance, life,

health, disability and general liability insurance were simultaneously triggered. Worker allowance for example represented 5.7% of aggregated 9/11 losses, while before, extreme events damage were almost entirely treated on the basis of property losses (against which other losses were marginal). This tendency towards higher correlation between insurance lines will also severely restrain risk portfolio diversification for insurers holding hazard risks.

Last, the 2001 attacks emphasized the issue of a third type of correlation. The dimension of direct and indirect economic losses of the World Trade Center attacks caused large damage **not only on the liability side, but also on the asset side of their balance sheet**. The sharp decline in financial markets *immediately following the attacks* also affected insurance companies which saw steep drops in their stock prices. This in turn lowered their capacity to raise new capital in good conditions. Insurers were also affected by the financial market downturn in their role as major institutional investors. After such a major disaster, and depending on the financial market conditions and reactions, it may therefore become increasingly difficult to offset part of the catastrophic losses through investment policy. Insurers and reinsurers that are willing to cover terrorism risk may now have to improve correlations analysis among underwriting, investment, and credit and operational risks.

Terrorism-specific characteristics and rising unpredictability

The argument over the capacity of private insurance/reinsurance markets to cover terrorism risk has often appeared over the issue of the dimension and correlation of potential risks and following up capacity problems. However, risk connected with new types of terrorism cannot simply be compared to the well-known insurability issues associated with low probability and high consequences events. Beyond its extreme loss potential and the high risk correlation it produces, new terrorism risk is featured by a set of specific characteristics which turn into even greater uncertainty as to risk assessment and possibility of occurrence. Given insurers aversion to uncertainty, these severe conditions of generalized ambiguity affecting terrorism risk strongly deter its insurability.

The analysis of the 9/11 events and of former terrorist attacks has lead to the identification of several provocations that make terrorism essentially different from other types of extreme events:

- Limited importance of historical data: analysis of past intentions of terrorists does not make their future thoughts more predictable; more generally, available data from past events consequently reveals little about the future patterns of terrorist actions. Furthermore, the appearance of new types of terrorism, as revealed by the 9/11 events in particular, further discredit the use of statistics on past events since no former attack can be put in balance with that of 2001. This main difference between terrorism before and after 11 September 2001, as well as between intended man-made events and unintended or natural events, considerably limits insurers' activity, for which projections based on statistical series are most often a central way for the development of a market.
- "Dynamic uncertainty", results from the permanent change in the aligning and nature of risks as terrorists comply to emerging prevention strategies adopted by private bodies and governmental authorities; they may for example switch attention to weak targets: as certain targets become "harder" *(e.g.,* increased security at governmental facilities), wise terrorist organizations may switch to softer targets (*e.g.* commercial facilities), in order to maximize the chances of success of the planned attack. Terrorists may even switch at the very last minute to targets of opportunity. The literature on terrorism risks has recently

highlighted these negative externalities potentially generated by self-protection measures.

The hardening of certain targets might transfer additional risk to other locations, so diminishing or entirely neutralizing the effects of self-protection measures from a societal point of view and eluding efforts to predict, alleviate and cover terrorism risk.

- "Interdependent security" is another possible source of negative externality affecting decision making processes in terrorism prevention. Even if the insured invests in efficient security measures, it may nevertheless suffer losses due to an insufficient level of prevention taken by other economic actors whose activities are connected with that of the insured. This may deter firms from investing in prevention, making it difficult for insurers to provide incentives (such as premium reduction) for terrorism coverage, and raises significant problems for insurance companies to relevantly measure the exposure of their client to terrorism.
- "Symmetry of non-information" refers to the lack of information on risks incurred. It affects both the insurer and the insured, since most of the information available is classified, and the most informed body, the government, do not reveal it for security reasons. Historical databases on damage from natural menace in most regions are now generally at disposal. On the other side, data on terrorist activities and future possible targets are usually kept secret for security reasons. While insurance operation may often be cut off by lack of symmetry of information between the insured and the insurer, terrorism insurance is limited by what has been intelligently qualified as "symmetry of non-information".
- Last, the critical influence of governments on the risk through foreign policy and counterterrorism measures, is a very specific feature of terrorism risk, adding, among other consequences, to risk unpredictability.

Conclusions

In the past, insurers have covered risks of hardly predictable likelihood – risks related to new technologies for instance. Similarly, insurers cover various large scale (and highly correlated) risks, and managing very large exposures is one of the very *raison d'être* of the reinsurance business in particular. The specificity of new forms of terrorism risk however lies in the conjunction of both potentially catastrophe-sized losses and very high risk unpredictability. This combination of two major challenges to insurance providers may radically influence their view on insurability, and provide a plausible explanation of a global disruption in insurance markets as witnessed after the World Trade Center attacks. Terrorism therefore appears more challenging to insure than in the past, and in various respects more difficult to predict, prevent, mitigate and eventually cover than many other extreme events.

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