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Systemic risks and the insurance sector:

What role can the insurance sector play in protecting society against risks that are so large in scale they render traditional risk transfer mechanisms unsuitable?

By Matthew Clissitt

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01 Introduction

Systemic risks – risks, such as COVID-19, that are so large in scale they can cause the breakdown of an entire system – not only pose a major threat to society but also render traditional risk transfer mechanisms unsuitable, calling into question the role of the insurance sector in addressing them. This paper considers the nature of such risks and analyses what role the insurance sector can play in providing solutions for risks whose intrinsic nature makes them impossible to cater for within the traditional risk transfer paradigm.

The topic has been chosen because of the societal vulnerability to systemic risks and the apparent inability of conventional insurance products to cater for them. Given their emerging nature and the topicality of COVID-19, this paper predominantly explores the question of systemic risk through a consideration of pandemic risk. Additionally, because this paper has been written at a time when the full extent of the impact of COVID-19 is still unknown, its research is limited to a finite amount of online data, papers and articles on the evolving subject matter.

The paper comprises four key segments and shall consider the challenges posed by systemic risks before assessing the sector's potential role in assessing, preventing and transferring them.

As part of its analysis, the paper considers how the insurance sector can mitigate the impact of systemic

risks, both inside and outside the framework of risk transfer. In reviewing the options for risk transfer, the paper considers several combinations and structures, including the use of pools, capital markets and government funding, and contends that the most important and effective part the sector can play is by combining skillsets and capital in collaboration with governments through public-private partnerships.

In analysing the role of the insurance sector, this paper refers to the non-life (P&C) insurance sector and considers society to represent individuals and businesses. Traditional risk transfer mechanisms are considered to be insurance contracts where the underlying capital is provided by insurers and reinsurers.

It is important to note that this paper does not concern itself with systemic risk of financial management and/or regulatory systems, i.e. risk that can be attributed to the collapse of financial systems and markets such as the financial crisis of 2008. Rather systemic risk is considered in a societal and economic context through the lens of the insurance sector, whether or not it is insurable.





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02 What are systemic risks and why are they significant?

Definitions

'Systemic risks' refer to risks that are so large in scale that they have the potential to cause economic and societal losses that are sufficiently significant to result in the breakdown of an entire system. Unlike typical catastrophic risks, systemic risks simultaneously impact such a large proportion of society, across multiple geographies, industries and classes of insurance, that traditional risk transfer mechanisms are rendered unsuitable as the risk can neither be mutualised nor absorbed effectively. The immensity and unpredictability of their nature means they are sometimes referred to as 'black swan' events, although this label has been challenged'. They are also extremely difficult to quantify and understand, however this schematic from Lloyd's provides a useful indication of the type of events that may constitute systemic risks and their potential impact on society.

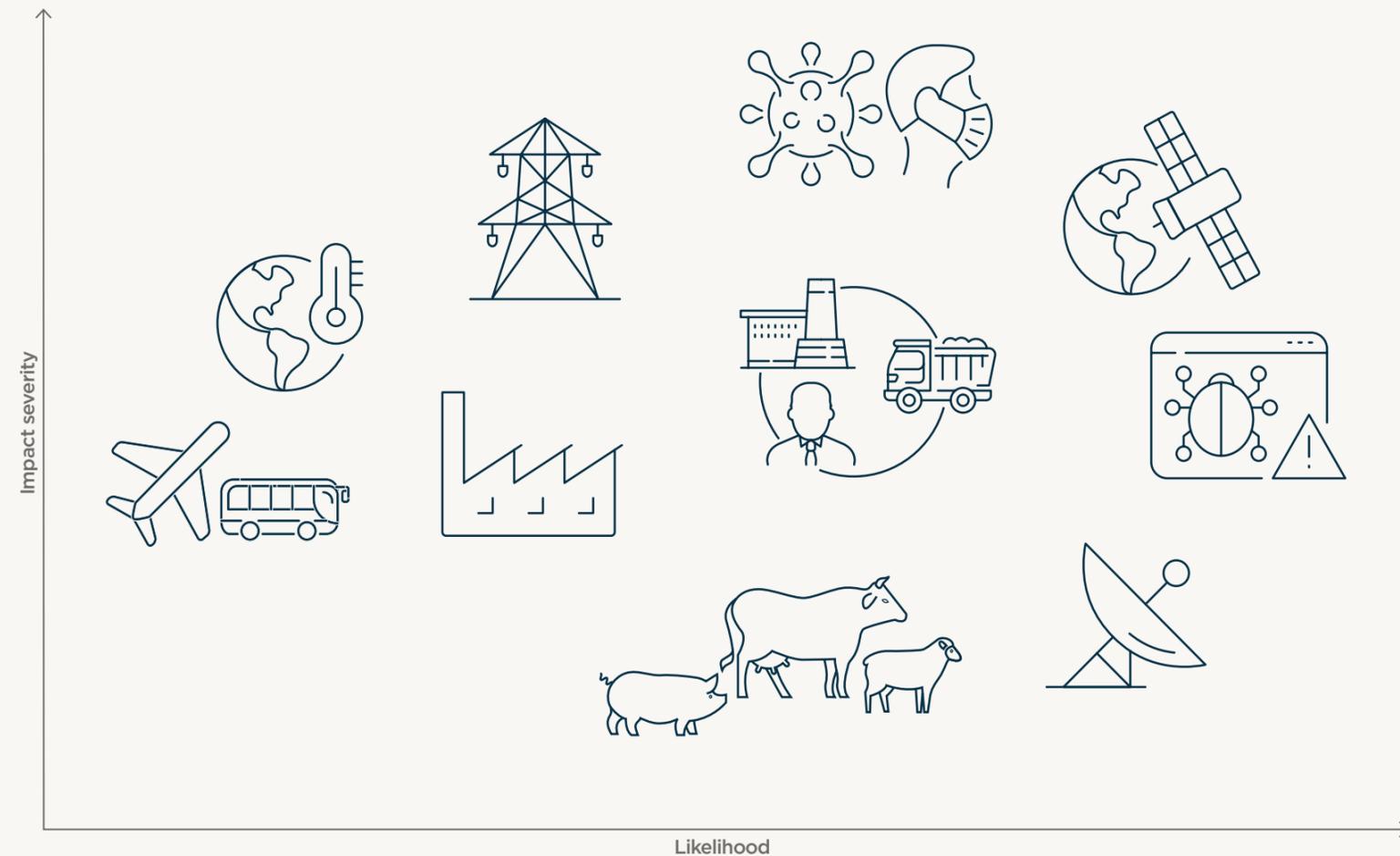


Figure 1: Lloyd's schematic depicting potential systemic risks²

From left to right: Widespread transport disruption, Impact of accelerated climate change, Widespread industrial disruption, Widespread electricity failure, Animal disease, Critical resources supply chain failure, Pandemics, Utilities failure (including internet), Space weather, and Widespread cyber attack.

- 1 Including by the author of the term 'black swan', Nicholas Taleb, himself. - The New Yorker article (21st April 2020), <https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system>
- 2 Lloyd's (2020), Supporting global recovery and resilience for customers and economies



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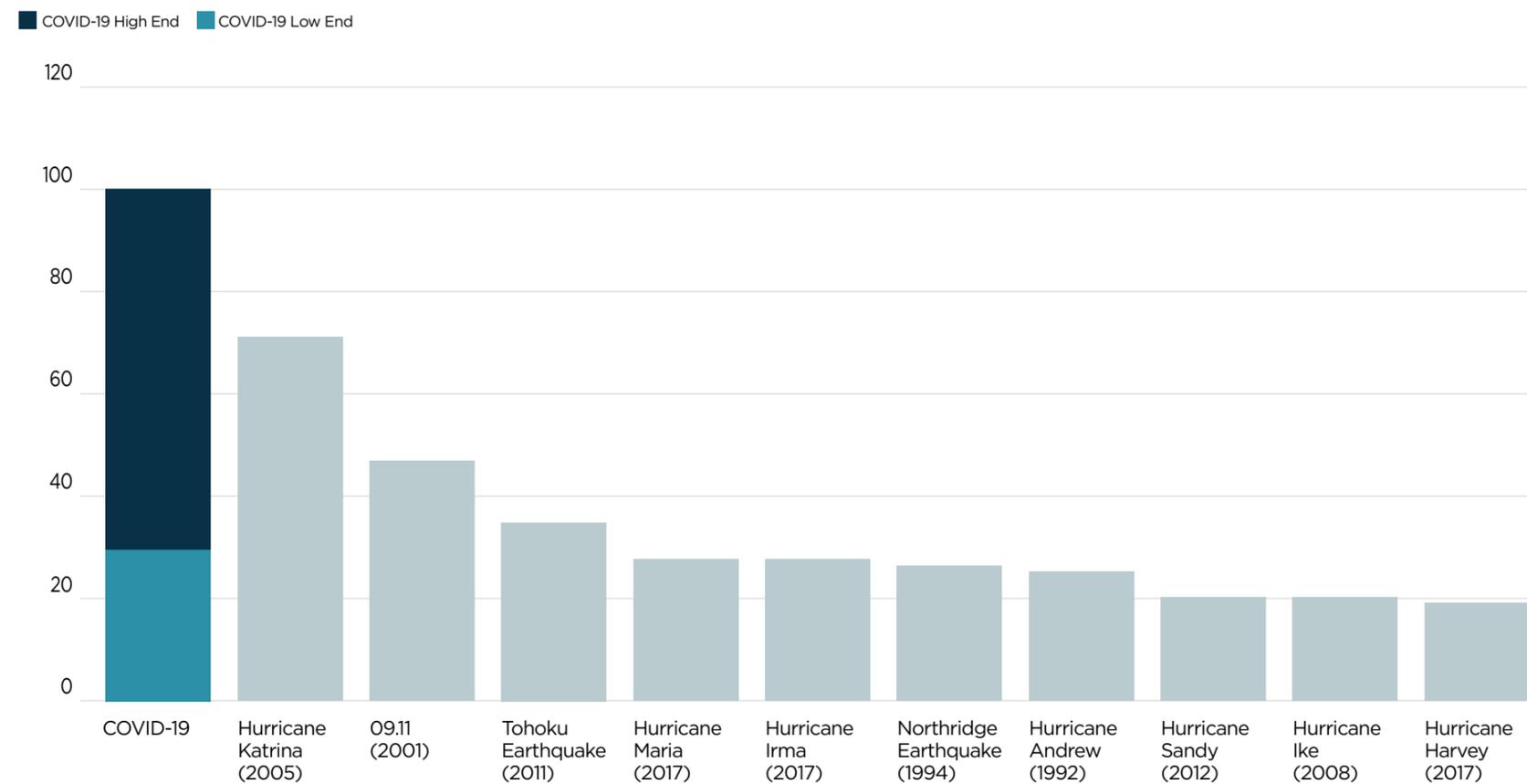
02 What are systemic risks and why are they significant?

COVID-19

The most recent example of a systemic risk event is the COVID-19 pandemic whose impact on the global economy has been estimated to exceed \$10 trillion³ and required unprecedented amounts of financial support from governments to businesses and individuals worldwide. Lloyd’s estimates that the underwriting sector will contribute \$107 billion towards the total cost⁴, meaning the insurance sector’s contribution equates to approximately 1% of the estimated total economic impact whilst still representing the largest underwriting loss to date.

Although the pandemic has impacted multiples classes of insurance⁶, the key coverage that has been impacted is business interruption, and in particular non-damage business interruption. It is worth noting that the majority of business interruption claims relating to COVID-19 have been rejected (over 98% according to the OECD⁷); however a review of the reasons why – other than an understanding that the coverage provided was in general terms neither broad nor particularly clear – is beyond the scope of this paper. What COVID-19 has nonetheless demonstrated is the magnitude of claims that can arise from business interruption, and it is highly likely that business interruption would be the most impacted coverage for other types of systemic risk events also⁹.

Figure 2: Largest underwriting losses to date⁵



3 The Economist article (7th January 2021), <https://www.economist.com/finance-and-economics/2021/01/09/what-is-the-economic-cost-of-covid-19>

4 Lloyd’s (2020), op. cit.

5 OECD (2021), Addressing the Protection Gap for Pandemic Risk: Setting the Scene

6 Such as Business interruption, General Liability, D&O, Contingency, Travel and Event Cancellation to name a few.

7 Organisation for Economic Co-Operation and Development

8 OECD (2021), op. cit.

9 Although it is acknowledged that a cyber attack could cause significantly large losses to the cyber industry.



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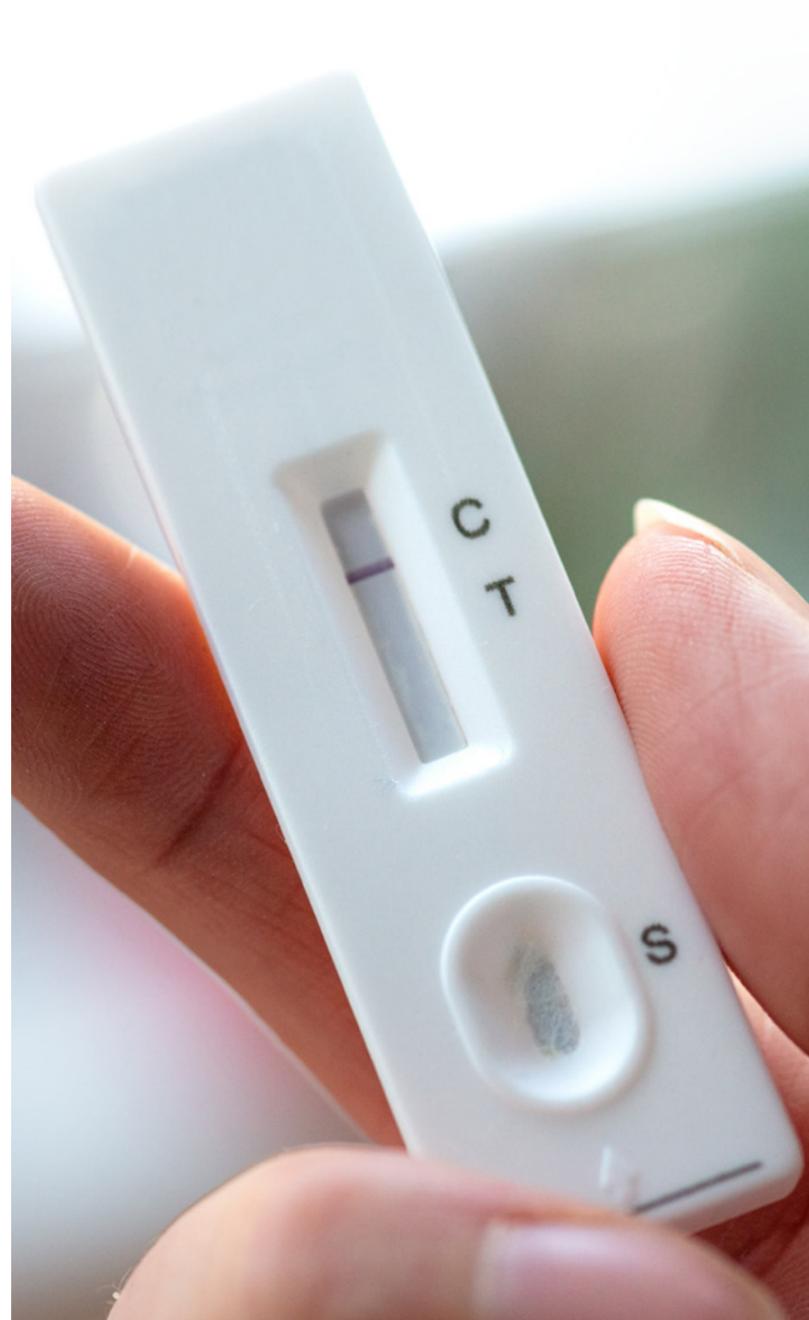
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02 What are systemic risks and why are they significant?

Industry capitalisation

Whilst the insurance sector has a strong track record in responding to large losses and evolving risks, a key challenge posed by systemic risks is that losses can occur on such a large scale that they exceed the industry's capital base of \$2 trillion¹⁰. Even if the entirety of this amount was allocated to pay COVID-19 losses (which is unfeasible given the necessity to pay claims for many other types of losses) it would still fall considerably short of the total anticipated losses.

This shortfall exposes an inability for the insurance sector to absorb losses for systemic risks via traditional risk transfer mechanisms. The remainder of this paper is dedicated to analysing what role the sector can play in protecting society from systemic risks when traditional risk transfer mechanisms are not an effective solution.



Resilience

Where traditional risk transfer mechanisms fail, the insurance sector can still look to protect society from systemic risks. According to Lloyd's, the sector must find ways of providing society with greater resilience over the medium to longer term¹¹. A 2020 paper¹² by EIOPA¹³ identified four key elements of an envisaged shared resilience solution for pandemics:

- Risk assessment;
- Risk prevention;
- Product design; and
- Risk transfer.

Combining the third and fourth elements into one (under the heading of Risk transfer), this paper shall analyse the potential role of the sector through these three lenses.

¹⁰ Lloyd's (2020), op. cit.
¹¹ Lloyd's (2020), op. cit.
¹² EIOPA (2020), Issues paper on shared resilience solutions for pandemics
¹³ European Insurance and Occupational Pensions Authority



03 Risk assessment

Understanding systemic risks

In order to better understand systemic risks, and understand how best to prevent or transfer them, the sector should collaborate both internally (e.g. amongst insurers and brokers) and externally (e.g. with academic partnerships¹⁴, think tanks and governments). This position is supported and reinforced by Lloyd's proposal of a centre of excellence where an understanding of systemic risks can be shared and developed¹⁵.

Protection gap

The 'protection gap' is generally regarded as the difference between total economic losses and

insured losses. Applying the numbers referenced above, the COVID-19 protection gap could be estimated to be as much as \$9.9 trillion. The following natural catastrophe protection gap chart illustrates the significance of risk protection gaps.

It is worth noting that whilst the total economic impact of the pandemic will without doubt be of an unprecedented magnitude, the \$10 trillion estimate takes into account predicted lost GDP and includes some element of uninsurable risk. Nonetheless these figures point to a likelihood of an extremely large protection gap.

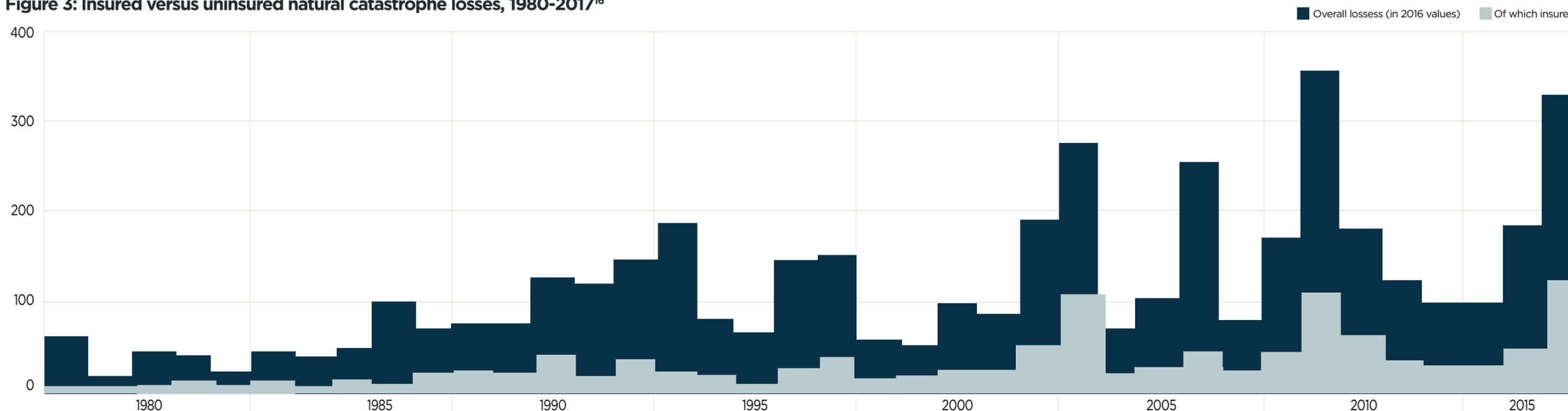
Protection gaps are not solely attributable to supply-side influences but are often the result of demand-

side factors too, as evidenced by the lack of take up for PathogenRX¹⁷, a specific business interruption product for pandemic risk, pre-COVID-19¹⁸.

Notwithstanding this, the sector should adapt to customers' changing needs, or risks losing customers who could seek to establish or increase their use of self-insurance through captives, or not buy cover at all¹⁹ (thereby exacerbating the protection gap further).

- 14 Various work is already being undertaken with academic partnerships, such as collaborative projects between the insurance sector and the University of Cambridge Judge Business School.
- 15 Lloyd's (2020), op. cit.
- 16 The Geneva Association (2018), Understanding and Addressing Global Insurance Protection Gaps
- 17 Developed by Marsh in collaboration with Metabiota and Munich Re. Marsh website, <https://www.marsh.com/us/campaigns/pathogenrx.html>
- 18 Marsh (2020), Pandemic Risk Protection
- 19 Lloyd's (2020), op. cit.

Figure 3: Insured versus uninsured natural catastrophe losses, 1980-2017¹⁶





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03 Risk assessment

Societal vulnerability

There are several societal vulnerabilities, as exposed by COVID-19, that the insurance sector should consider in assessing, preventing and transferring systemic risks. The most pertinent are noted below:

Interdependency of society: Longer and more complex supply chains exacerbate society's interdependency and exposure to systemic risk events²⁰.

Interconnectivity of risk: The growing interconnectivity of risk reduces the ability of insurers to diversify systemic risks effectively²¹.

Resilience of SMEs²²: Globally, two in every three people work in an SME business²³ and in the UK over 99% of all businesses are SMEs²⁴. Yet, as per a 2020 report by the UNDRR²⁵, SMEs are disproportionately impacted by systemic risks²⁶.

Global impact: The globalisation of society has enabled systemic risk events to impact countries worldwide simultaneously and as per a 2020 G7 press release "COVID-19 shows that the world needs stronger defences"²⁷.

Insurability

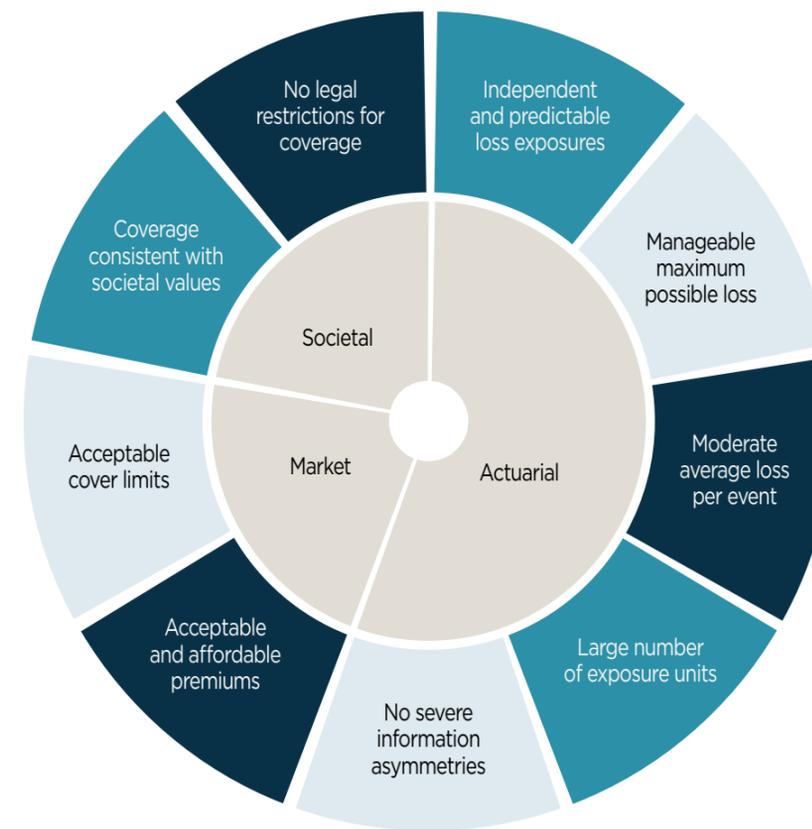
According to a 2019 survey by Aon only around half of all risks are insurable, and less than a quarter of all risks are fully insurable²⁸. Whilst the notion of insurability can be subjective, a 2020 investigation into the insurability of pandemic risk by The Geneva Association points to a helpful theoretical basis²⁹ of assessing insurability by supposing that a risk is not commercially insurable if any key element is not present.

Critically, the model highlights numerous factors³¹ that make not only pandemics, but systemic risks in general, uninsurable. Whilst it is in many ways compelling, the practicality of Berliner's theory is not quite so straightforward (particularly as it is debatable as to whether other types of risks for which an insurance market clearly exists – such as cyber – would pass the test). Speaking at a Marsh-OECD conference in March 2021, Lloyd's CEO John Neal opined that "there are few risks that are truly uninsurable", proposing that it was in fact possible to provide cover for systemic risks³².

Clearly, the notion of insurability is to some extent fluid, as demonstrated by the fact that risks can become more insurable over time (such as terrorism in the period from the immediate aftermath of 9/11 to now).

Understanding the insurability challenges is therefore critical for the insurance sector in designing potential solutions to systemic risks, and the ability to insure systemic risks shall be reviewed further under the 'Risk transfer' section of this paper.

Figure 4: The fundamental criteria of insurability³⁰



20 Five years prior to the COVID-19 pandemic the University of Cambridge Judge Business School in a 2014 taxonomy of threats referenced the ability for risks that are systemic in nature to impact companies, business counterparts and parts of the economic system at the same time, yet the industry remained underprepared for revelation of the pandemic. - University of Cambridge Judge Business School (2014), A taxonomy of threats for complex risk management

21 as exemplified in a 2020 report by AXA in the context of COVID-19. - AXA (2020), AXA Future Risks Report

22 Small and medium-sized enterprises

23 OECD (2019), SME and Entrepreneurship Outlook 2019

24 House of Commons (2021), Briefing paper on Business statistics

25 UN Office for Disaster Risk Reduction

26 UNDRR (2020), Reducing risk & Building resilience of SMEs to disasters

27 G7 Press Release (February 2021), <https://www.consilium.europa.eu/en/press/press-releases/2021/02/19/g7-february-leaders-statement/>

28 46.3% of risks were found to be uninsurable and 24.6% of risks are fully insurable

29 As advocated by Baruch Berliner in 1982 (note, this is a commercial, and not legal, model)

30 Based on Baruch Berliner's 'Limits of Insurability of risks (1982)'. - The Geneva Association (2020), An Investigation into the Insurability of Pandemic Risk

31 Including 'Independent and predictable loss exposures', 'Manageable maximum possible loss', 'Moderate average loss per event', 'Large number of exposure units', 'Acceptable and affordable premiums' and 'Acceptable cover limits'.

32 Insurance Insider article (24th March 2021), <https://www.insuranceinsider.com/article/28b6jcyuw7pvrs8wuig3k/ceo-neal-ops-lloyds-covid-19-claims-tally-to-approaching-6bn>



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04 Risk prevention

Where traditional risk transfer mechanisms fail, the insurance sector could seek to protect society in two different ways: risk prevention and non-traditional risk transfer.

There are two key ways in which the insurance sector could prevent risk. The first is in applying its skills and knowledge to help prevent systemic risks occurring. The second is in building incentives designed to encourage risk management into its risk transfer solutions.

Skills and knowledge

The Aon survey referred to above³³ also found that only 24% of respondents quantify their top 10 risks³⁴, highlighting a societal under-preparedness that could be exposed by systemic risks. Given the insurance sector’s skillset, knowledge and data, it appears uniquely poised to assist society in managing this risk, and brokers could serve as the ideal administrators given their role in the distribution chain. A 2020 Marsh paper underlined this value by asserting that the sector has a role to play in developing and encouraging the adoption of loss reduction measures for systemic risks, as it has done previously with key risks such as natural catastrophes and cyber threats³⁵.

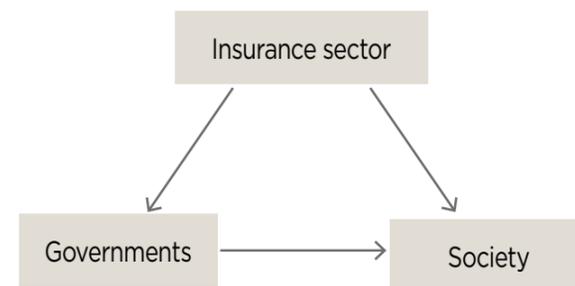
However, whilst this may be true on a general basis, it is less obviously the case for systemic risks. This is fundamentally because:

- There is a lack of data available on systemic risks generally; and

- Risk mitigation for systemic risks can only be effective if all (or at least most) policyholders implement the risk mitigation measures, which may require action from governments as well as policyholders.

Consequently, the insurance sector may instead harness its skills and knowledge to advise governments so that governments themselves can effect risk management amongst society in a way that has a more profound effect on preventing the risk of systemic events, resulting in a tripartite risk prevention paradigm as depicted below:

Figure 5: The tripartite relationship for systemic risk prevention



Additionally, the extent of the sector’s modelling capabilities is unparalleled (e.g actuaries) and the output of extreme event modelling could also be shared with governments for greater use in preventing systemic risks from occurring. In doing so, the sector can indirectly play an important role in protecting society from such exposures.

On top of this, the sector can use its expertise from insurance management and captive advisory

services to help manage risk in situations where the same organisation is still bearing the economic risk. This is relevant to solutions where governments underwrite some of the costs that may otherwise fall on them in any event, as is discussed later in this paper.

Incentives

According to the OECD, the sector can also encourage risk reduction by ensuring that the process of transferring risks supports risk management³⁶. One way of doing this is to build premium and coverage incentives into product offerings³⁷. Such an approach would not only reduce the level of risk but also avoid future market failures.

However, given the lack of data available for systemic risks, insurers may lack the necessary tools to measure the efficiency of the prevention measures to accurately reflect the impact it should have on premium and coverage³⁸. Additionally, such an approach could unfairly penalise businesses who are unable to reduce the risk beyond a specified acceptable level, although the system does appear to work effectively for certain catastrophe pools, such as Pool Re and Flood Re³⁹.

It is clear, therefore, that the sector has a role to play in preventing systemic risks and in doing so reducing the amount of risk that society needs to transfer. However, the sector’s role in risk prevention is at times indirect and its impact may be limited compared to that on non-systemic risks.

33 Aon (2019), Global Risk Management Survey 2019
 34 Although this is likely in part due to top risks being harder to quantify and/or uninsurable
 35 Marsh (2020), op. cit.
 36 OECD (2020), Responding to the COVID-19 and pandemic protection gap in insurance
 37 As is already the case for various classes of insurance including property, workers’ compensation and cyber risks. - Marsh (2020), op. cit.
 38 EIOPA (2020), op. cit.
 39 Marsh (2020), op. cit.



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05 Risk transfer

As observed earlier, industry funds alone are unable to absorb the scale of systemic risk events and therefore novel structures and solutions are required.

Capital markets

Alternative risk transfer (otherwise referred to as ‘ART’) is commonly associated with financial instruments such as insurance-linked securities⁴⁰ (typically in the form of catastrophe bonds⁴¹) and structured derivative solutions⁴² that are based on single or sometimes multiple parametric triggers⁴³. Initial research suggests that capital markets may well have appetite to underwrite products that offer protection against future pandemics⁴⁴, which opens up the possibility of a combination with the insurance sector to provide a solution for systemic risks more generally. Such a solution would effectively see the insurance sector use its expertise to assess and underwrite the risk on behalf of capital markets (as well as its own capital) leaving the policyholder with an alternative form of insurance product.

The key advantage of this model is that it provides access to the capital markets’ capital base of \$180 trillion⁴⁵ whilst maintaining the use of the sector’s underwriting skillset.

However, the model also has several limitations:

- Whilst ART solutions are often deployed to absorb the shock of catastrophe risks (e.g. natural catastrophes and terrorism risks), these types of catastrophe risks are more localised, impacting

a limited amount of people for a limited amount of time, and are therefore diversifiable⁴⁶. The lack of diversification opportunity is likely to dissuade the deployment of sufficient capacity to make an insurance sector-capital markets solution meaningful enough to address the scale of systemic risks.

- In the short-term, the very limited use of ART to cover pandemic risks to date suggests that capital markets may require disproportionately high premiums⁴⁷, which could lead to unaffordability amongst policyholders and in turn exacerbate the protection gap.
- Economic cycles for systemic risks are likely to be more highly correlated⁴⁸ than other insurance risks with financial markets.

Therefore, whilst capital markets enable the potential expansion of commercial capital, this combination does not on its own provide a sustainable solution to protecting society against systemic risks.

Pools

NuclearPools.com describes insurance pools as “a mechanism whereby a number of insurers agree to appoint a common agent to underwrite jointly a particular risk or class of business” citing their use for risks that “require a capacity beyond the individual means of the members” or which present “some particularly hazardous aspect which would render acceptance by conventional methods difficult if not impossible”⁴⁹. They are, therefore, a possible solution to providing non-traditional risk transfer for systemic risks.

Whilst such arrangements provide the opportunity to share both knowledge and risks across market participants, the scale of existing pools for natural catastrophe and terrorism risks is very small in comparison to the losses posed by a systemic risk such as COVID-19⁵⁰. Based on this and the industry’s \$2 trillion capitalisation referred to earlier, without additional funding from the public sector even the widest of market pools would fail to reach a funding level sufficient to provide a sustainable risk transfer solution.

40 Insurance-linked securities (ILS) are investment assets generally thought to have little to no correlation with the wider financial markets as their value is linked to insurance-related, non-financial risks such as natural disasters, other insurable specialty risks and life and health insurance risks including mortality or longevity. – Artemis website, <https://www.artemis.bm/library/what-are-insurance-linked-securities/>

41 A catastrophe bond (CAT) is a high-yield debt instrument that is designed to raise money for companies in the insurance sector in the event of a natural disaster. – Investopedia website, <https://www.investopedia.com/terms/c/catastrophebond.asp>

42 A derivative is a financial security with a value that is reliant upon or derived from, an underlying asset or group of assets—a benchmark. The derivative itself is a contract between two or more parties. – Investopedia website, <https://www.investopedia.com/terms/d/derivative.asp>

43 Instead of indemnifying for the actual loss incurred, parametric insurance covers the probability of a predefined event happening (e.g., a major hurricane and earthquake), and pays out according to a predefined scheme. – Insurance Journal article (9th January 2020), <https://www.insurancejournal.com/news/international/2020/01/09/553850.htm>

44 Lloyd’s (2020), op. cit.

45 Lloyd’s (2020), op. cit.

46 The Geneva Association (2020), op. cit.

47 OECD (2020), op. cit.

48 Although not fully correlated, given a recession does not necessarily lead to a pandemic

49 Nuclear Pools website, <https://www.nuclearpools.com/about-us/>

50 EIOPA (2020), op. cit.



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05 Risk transfer

Public-Private Partnerships

As per a 2020 position paper issued by FERMA⁵¹, disruption caused by systemic risks poses a significant threat not only for business but for governments also, particularly when key national industries are affected. Consequently, “when handling systemic risks, governments are called upon to resolve market failures on an ad hoc basis, with little to no support available from the insurance community”⁵².

Therefore, notwithstanding the limitation of entirely privately-funded pools, there is value in exploring the concept of pools which include an element of public funding. According to a 2020 survey undertaken by RIMS⁵³, 91% of respondents were supportive of a government-backed loss-sharing scheme to cover insurance claims relating to pandemic losses⁵⁴, underlining the role that a mechanism that combines industry and government can play not only in assisting business but also in restoring confidence in the insurance sector. By way of context, a 2018 AXA XL report identified that there were at least 451 government-funded pools worldwide⁵⁵.

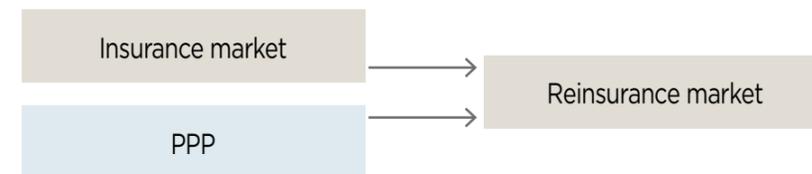
This form of arrangement is typically referred to as a Public-Private Partnership (or ‘PPP’) and enables the creation of special purpose vehicles that are capable of combining insurance sector expertise and capacity with sovereign funds (and sometimes capital markets capacity too).

Whilst PPPs all share a similar conceptual objective (to “transform uninsured risk into insurance-based

products”⁵⁶) they are heterogeneous in design. On a theoretical level, PPPs typically act as either an insurer or a reinsurer, and, despite an element of government involvement, have a finite fund (which is usually built up by premiums, levies or taxes).

The first structure below demonstrates how PPPs can sit alongside the insurance market. This application of PPPs is typically designed to preserve cover for a peril that is no longer available and/or affordable in the private insurance market⁵⁷. The CEA⁵⁸ (an earthquake insurance scheme in the US) is an example of this.

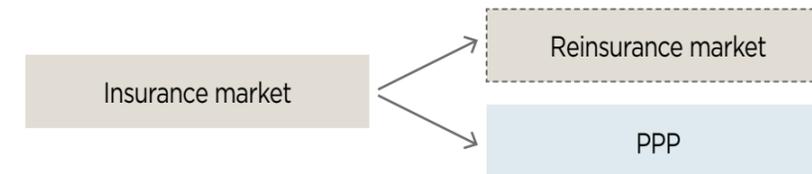
Figure 6: Example PPP acting as an insurance layer



Given the scale of systemic risks this model would not provide sufficient capital to address the issue.

The second structure demonstrates the function of a PPP as a reinsurer (often a pool combining private and public funds). This allows a portion of systemic risk to be covered commercially before a reinsurance pool steps in, typically serving the function of removing and redistributing risk from the primary market⁵⁹. Flood Re⁶⁰ (a flood insurance scheme in the UK) provides an example of this.

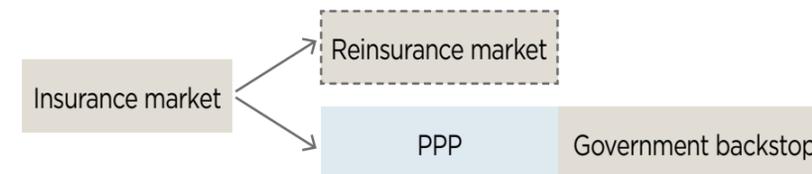
Figure 7: Example PPP acting as a reinsurance layer



Whilst this structure can assist with ensuring an insurance market is in place, like the previous structure its capped capital base also prevents it from providing sufficient funds to address systemic risks.

It would appear therefore that to meaningfully address the scale of systemic risks PPP vehicles must bring government funds into the equation. For example, some PPPs operate with a limited government backstop (effectively a guarantee that the government will step in to provide a pre-agreed level of capacity after either PPP funds are exhausted or losses reach a prescribed level), such as TRIA⁶¹ (which provides Terrorism cover in the US)⁶².

Figure 8: Example PPP acting as a reinsurance layer with government backstop



51 Federation of European Risk Management Association
 52 FERMA (2020), Position paper on Building an EU Resilience Framework for Catastrophic Risks
 53 Risk and Insurance Management Society, now trademarked as 'the risk management society'
 54 RIMS press release (20th April 2020), <https://www.rims.org/about-us/newsroom/news/rims-urges-congress-to-create-a-pandemic-risk-insurance-program>
 55 AXA XL (2018), Guide to government pools
 56 Cass Business School (2018), Between State and Market: Protection Gap Entities and Catastrophic Risk
 57 Cass Business School (2018), op. cit.
 58 CEA website, <https://www.earthquakeauthority.com>
 59 It can also act as a price-smoothing mechanism. - Cass Business School (2018), op. cit.
 60 Flood Re website, <https://www.floodre.co.uk>
 61 US Treasury website, <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/federal-insurance-office/terrorism-risk-insurance-program>
 62 Which has a \$100 billion per annum aggregate cap

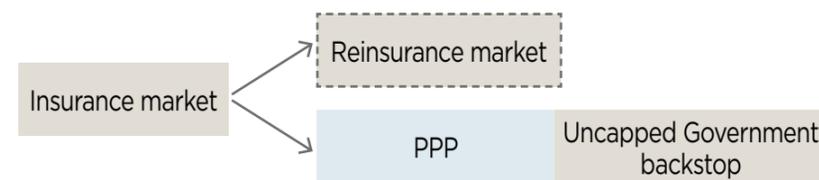


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05 Risk transfer

This structure is more effective than the previous two insofar as it enlists the support of sovereign funds in addition to the government involvement in the PPP vehicle. It could however be enhanced further if the government backstop is left uncapped, per the diagram below, as is the case for Pool Re (a reinsurance pool for terrorism cover in the UK)⁶³.

Figure 9: Example PPP acting as a reinsurance layer with uncapped government backstop



The inclusion of an uncapped (or at least very high) government backstop is critical when addressing systemic risks as without it any risk transfer model is reduced to only absorbing a slightly larger percentage of systemic risks than the current status quo (rather than the entirety – or at least majority – of their insurable impact).

Based on Figure 9, it is also possible to incorporate capital markets (either within the PPP vehicle or as a separate layer) in order to increase the level of private funding. Additionally, depending on the risk(s) covered, the mechanism could be pooled with other similar vehicles at a global level as per the reciprocal arrangement for reinsurance that underpins the sharing of risk amongst nuclear pools at an international level⁶⁴ (see Appendix 3).

Regardless of the differences in their operational features⁶⁵, the actions by various governments to establish PPPs in response to COVID-19 is telling, and includes PRIA (in the US), CATEX (in France) and GDV (in Germany) amongst others as listed in Appendix 1. This movement towards PPPs is likely due to the mutual benefits they provide for both industry and government. Key positives of the PPP model include the following:

- Governments can benefit from insurance sector skills and expertise;
- Insurance industry funds can be deployed securely in the knowledge that they are backed by government funding;
- Insurance sector infrastructure can be utilised to facilitate premiums and claims payments, boosting societal resilience and avoiding the need to establish public payment facilities⁶⁶;
- Insurance sector capital for systemic risks can be ‘incubated’ and grown over time, maximising the potential contribution of the insurance sector and reducing the exposure of governments, as demonstrated by the reducing federal reinsurance participation in TRIA⁶⁷; and
- Data on systemic risks that may only be available to either the insurance sector or governments can be shared to create a greater understanding of how to assess and prevent them.

Additionally, PPPs ensure that a greater proportion of the costs of systemic risk events is paid for by those protected⁶⁸ and enable the insurance sector to serve its traditional function (albeit in a non-traditional way) of transferring risk⁶⁹.

PPPs do, however, present some challenges:

- They are highly complex and likely to require a long lead time to set up;
- If the trigger for cover is determined to be a specified government action then this would pose a moral hazard as governments may be disinclined to initiate action in order to avoid triggering large insurance pay-outs that they could eventually be required to fund. Conversely, if governments could end up covering the costs anyway they may be incentivised to trigger a payment out of the private capital resources; and
- PPPs can have the effect of weakening insurer risk appetite as they can suppress market signals and reduce incentives to innovate⁷⁰.

Notwithstanding the challenges and complications of PPPs, this paper contends that these are outweighed by the significant benefits that PPPs create, and that PPPs with high or unlimited government backing offer a unique solution to managing and protecting against systemic risks. In fact, they would appear to offer the only viable risk transfer solution that can sustainably absorb the economic impact of systemic risks and, subject to appropriate boundaries, maximise the contribution that the insurance sector can make in protecting society from systemic risks more generally. Where government is playing a key role in both shaping⁷¹ and absorbing⁷² risk, the role of the insurance sector in traditional transfer mechanisms should be modified.

63 According to the Pool Re website, “The Government guarantee can be understood as a credit facility, that is not capped” and will step in to pay claims to their full extent when funds (currently £6.5 billion) are exhausted. - <https://www.poolre.co.uk/claims/>

64 NRI website, <https://www.nuclear-risk.com/nuclear-pools>

65 Including whether liability is capped, the pool is pre-funded or post-funded and used for single perils or multiple

66 GDV (2020), Green paper on Supporting the economy to better cope with the consequences of future pandemic events

67 From 90% in 2002 to 80% in 2020, while insurer deductibles have risen from 7% of premium in 2002 to 20% in 2020. - Marsh (2020), op. cit.

68 Lloyd’s (2020), op. cit.

69 Marsh (2020), op. cit.

70 Cass Business School (2018), op. cit.

71 For example, by imposing societal restrictions such as lockdowns

72 As part of a PPP



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05 Risk transfer

Parametric triggers

Parametric triggers could provide the ideal mechanism for PPP solutions given their clarity⁷³ and efficiency⁷⁴, thereby reducing the potential size of the protection gap which can be exacerbated by unclear coverage⁷⁵. It is worth noting however that parametric triggers can be challenging to link to risk management achievements at policyholder level⁷⁶, which may restrict the ability to incentivise risk mitigation through policy terms and conditions (see Incentives on page 9).

Considering the largest contributing factor to COVID-19 losses is government action it would seem logical that this should form the basis of any systemic risk transfer trigger. However, referring to Figure 1, other triggers may be more appropriate for say the impact of accelerated climate change, or a widespread cyber-attack.

Other potential triggers⁷⁷ include evidence of an alternative specified event (such as a WHO⁷⁸ pandemic declaration, or utility capacity reducing by more than determined percentage) or evidence of a specific level of business disruption.

Regardless, the choice of trigger is crucial in ensuring the product sufficiently addresses the risk it is intended to cover which is a challenging task given the emerging nature of systemic risks.



- 73 Reducing ambiguity of cover
- 74 Being able to settle claims at speed
- 75 As per COVID-19
- 76 EIOPA (2020), op. cit.
- 77 As suggested by Lloyd's (2020), Open source frameworks for systemic risk
- 78 World Health Organisation



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05 Risk transfer

No risk transfer

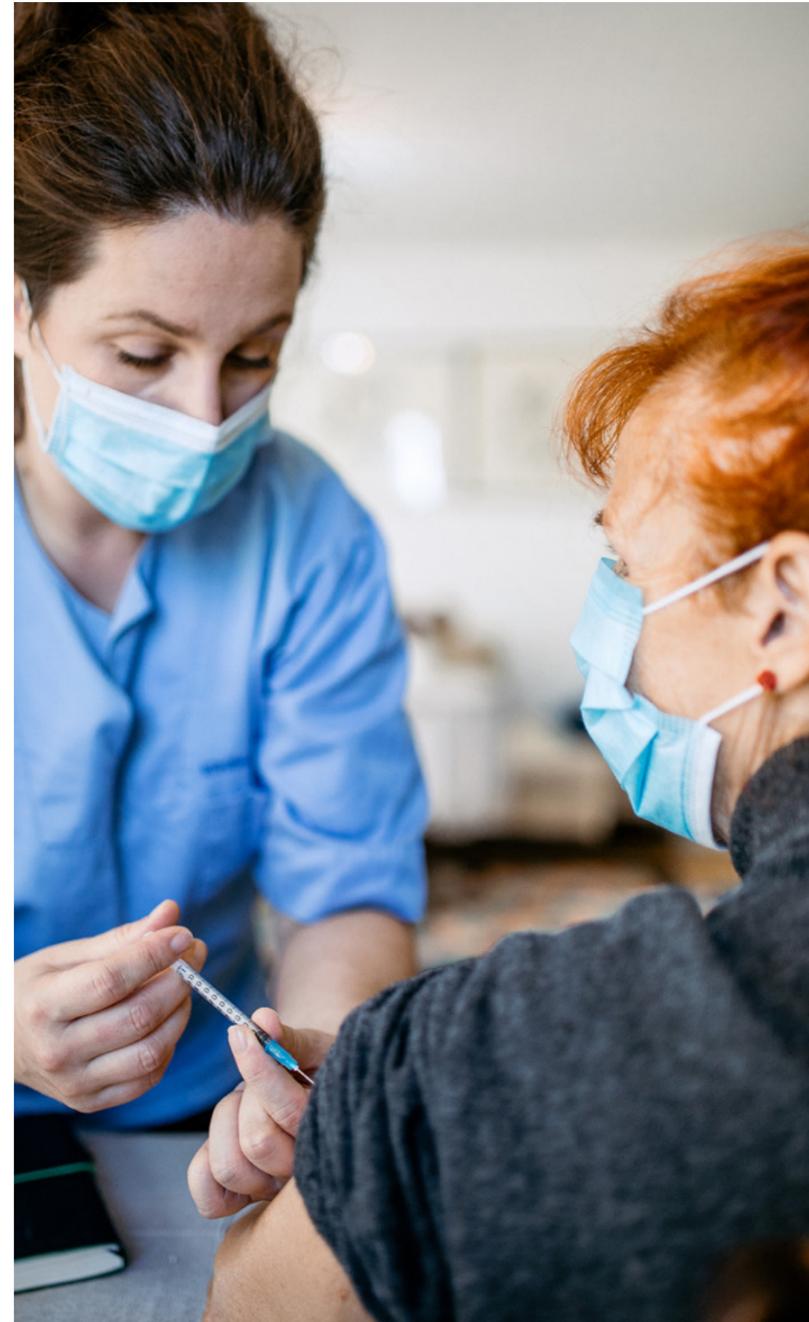
An alternative to consider is whether a better solution may be for government and economic operators to bear the risks directly without involvement of the insurance sector.

On the one hand, allowing the liabilities of systemic risks to be handled directly by governments may be a more efficient mechanism given they are the ultimate bearer of the loss. After all, it is not the insurance sector's role to reduce government expenditure (nor the taxes that might follow). Additionally, if systemic risk events occur too frequently they could threaten the ability of the sector to remain solvent and continue operating in its valuable function of absorbing other risks.

Moreover, given the rates of rejection of COVID-19 claims referred to earlier (and the litigation in the UK Courts⁷⁹) it could be questioned as to whether the insurance sector is a reliable player in responding to systemic risk at all.

However, the PPP structures discussed above provide a framework and an infrastructure which in practice is likely to make managing systemic risks more efficient, and an insurance mechanism which means the people at risk can contribute more directly to their costs.

With regard to the COVID-19 litigation, it could be argued that not only have the UK Courts demonstrated that the system works (albeit with a loss of some trust in insurers) but the litigation serves to underline the desirability of product



innovation and parametric solutions that address systemic risks better.

All that said, this paper seeks to discuss what role the sector *can* play in protecting society from systemic risks, rather than what it cannot, and PPPs remain, in this paper's opinion, the most critical vehicle in which the insurance sector can play that role.

Innovation

In addressing systemic risks going forward it is important that the sector continues to innovate. Such innovation can take place within⁸⁰ or outside of the traditional risk framework, however as articulated in this paper only non-traditional risk transfer products will be capable of absorbing systemic risk events. Innovative models, such as the Lloyd's trilogy of post-pandemic open source frameworks for insuring systemic risks published in 2020⁸¹ are good examples of these.

It is also important that innovation is not solely focused on the immediate issue of the pandemic but is actively engaged in horizon scanning for future systemic risks, which could include a multitude of systemic risks as depicted by Figure 1. Climate change, cited by former governor of the Bank of England Mark Carney as a risk that will have a higher mortality rate than COVID-19⁸², is a topical example of an emerging systemic risk that the sector has a role to play in addressing. According to a 2020 Swiss Re press release, climate change will not only be a "huge test of global resilience" it will also not be a black swan event, owing to its slow onset⁸³.

79 Insurance Business UK article (22 January 2021), <https://www.insurancebusinessmag.com/uk/news/breaking-news/surgeon-in-covid19-litigation-awaits-uk-companies-warns-gallagher-244269.aspx>

80 Parsyl, a solution created to address the insurance for the transportation of COVID-19 vaccines to underdeveloped countries, is an excellent example of the sector stepping in to help fix the breakdown of a supply chain and provide societal resilience. - <https://www.parsyl.com/>

81 Lloyd's (2020), Open source frameworks for systemic risk

82 BBC article (5th February 2021), <https://www.bbc.co.uk/news/business-55944570>

83 Swiss Re press release (15th December 2020), <https://www.swissre.com/media/news-releases/nr-20201215-sigma-full-year-2020-preliminary-natcat-loss-estimates>



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06 Conclusion

In considering the role of the insurance sector in protecting society against systemic risks this paper finds that the sector has an important role to play in all three fundamental elements of resilience: assessment, prevention and transfer, and that these elements are not independent of one another, i.e. a level of interaction exists amongst them.

In addition, this paper concludes that the following points are critical to understanding the role of the sector in tackling systemic risks where non-traditional risk transfer mechanisms are unsuitable:

- It is vital that the insurance sector gains a better understanding of systemic risks, which in turn is key to enabling it to play an effective role in both their prevention and transfer.
- All three elements of resilience (assessment, prevention and transfer) require a collaborative approach from the insurance sector. This includes internal collaboration (amongst itself), and external collaboration with governments, academic partnerships and alternative sources of capacity.
- The sector has a critical role to play in bringing its skills, knowledge and data to bear to address systemic risks in non-traditional ways. This includes how it assesses risk, provides mitigation techniques, and brings together risk and capital.
- The most effective role the sector can play in transferring systemic risks is in combination with governments as part of PPP arrangements which include government backstops. Whilst PPPs are complex and not without their challenges they provide a mutually beneficial solution (making efficient use, amongst other things, of industry infrastructure and government funds) and are the only mechanism that the insurance sector can be part of that can meaningfully absorb the scale of systemic risk impacts. In doing so the people at risk from systemic risks can contribute more directly to their costs, and the sector can assume its principal role of transferring risk away from policyholders, thereby restoring economic confidence and helping to build a more resilient society.

In summary, the inherently different nature of systemic risks requires solutions that are also inherently different to traditional risk transfer mechanisms, and in order to protect society the sector should work in collaboration with others to provide these.



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Appendix 1: Overview of selected pandemic risk insurance programme proposals

Proposal	Distribution	Type of coverage	Perils	Eligible policyholders	Coverage trigger	Government involvement
EIOPA (Europe)	Insurance sector (bundled with other coverage)	Non-damage business interruption (potentially parametric)	Pandemic	SMEs (potentially)	Not specified	National government (third risk layer) Europe (fourth risk layer)
CATEX (Federation française des assureurs)	Insurance sector (attached to commercial property or business interruption policies)	Business interruption (fixed amount)	Extraordinary events (cyber, terrorism, pandemic, etc)	SMEs	Government administrative order	Reinsurance (CCR)
GDV (Germany)	Insurance sector (levy or policy extension)	Business interruption	Pandemic (or epidemic)	No restriction	WHO/German authority declaration	Retrocession/guarantee (highest layer)
ReStart (Lloyd's)	Insurance sector	Business interruption	COVID-19	Small companies (potentially all SMEs)	Not specified	None
Recover Re (Lloyd's)	Insurance sector (stand-alone, multi-year policy)	Non-damage business interruption	Pandemic and other perils	No restriction	Not specified	Guarantee against default on future premium payments
Black Swan Re (Lloyd's)	Insurance sector	Non-damage business interruption (systemic event)	Systemic risk perils	No restriction	Not specified	Government backstop for reinsurance pool
Pandemic Risk Insurance Act (United States)	Insurance sector	Business interruption and event cancellation	Pandemic and infectious disease outbreaks	No restriction	Certification by Secretary of Health and Human Services	Cover losses above insurer (and industry) deductible
Business Continuity Protection Program (APCIA, NAMIC, Big I-United States)	Insurance sector (stand-alone policy)	Business interruption (80% of eligible operating expenses for up to 3 months)	Pandemic	No restriction	Health emergency declaration	Government would pay all claims
Pandemic Business Interruption Program (Chubb - United States)	Insurance sector	Business interruption (fixed payment based on a multiple of payroll costs)	Pandemic	SME programme and larger company programme	Pandemic declaration and lockdown order	Co-insurance and backstop (SME programme) Government reinsurer (larger companies)

Source: OECD (2020), Responding to the COVID-19 and pandemic protection gap in insurance



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Appendix 2: List of government pools: World regional view

Peril	Africa	Americas	Asia	Europe	Oceania	Global**	Total
Agricultural Pool	-	-	-	2	-	-	2
Drought	17	8	5	1	-	-	31
Earthquake	-	5	10	1	1	-	17
Environmental Liability Risks Pool	-	-	-	3	-	-	3
Flood	3	8	12	2	1	-	26
Motor	-	-	2	2	-	-	4
Multi-peril	-	6	-	-	-	-	6
Natural Catastrophe Pool	15	31	21	13	1	3	84
Nuclear	2	7	4	14	1	-	28
Other*	38	57	60	35	1	-	191
Terrorism	3	2	4	10	1	-	20
Wind	-	28	6	5	-	-	39
Total	78	152	124	88	6	3	451

Source: AXA XL (2018), Guide to government pools

*Other Perils include Agricultural Insurance and Reinsurance, War, Energy, Medical, Aviation, Cargo, Engineering, Oil, Gas exploration, Micro Insurance, Marine, Loan Guarantee, Motor, Employers Liability, Disaster Micro Insurance Pools, Pools for Enterprises involved in hazardous activities.

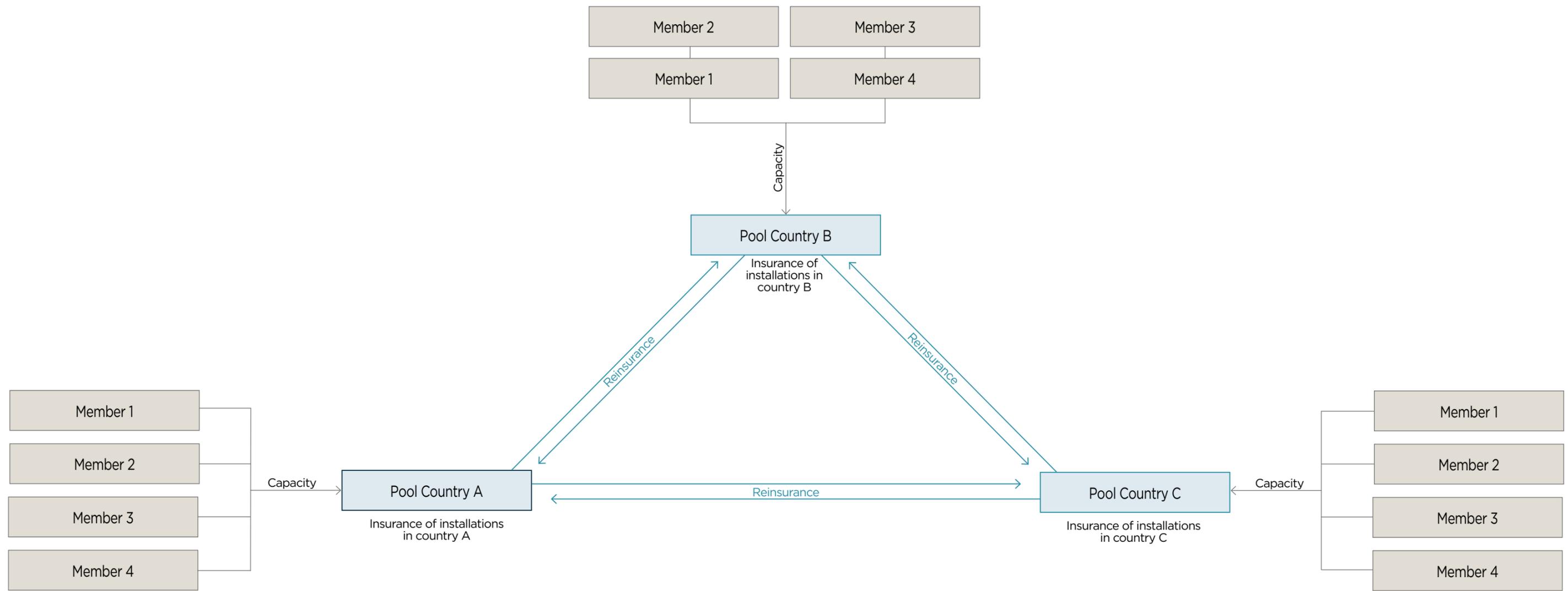
**Global pools include Global Climate Insurance Pool (initiative put forward by MCII (Munich Climate Insurance Initiative); Global Index Reinsurance Facility (GIRIF) managed by the World Bank; Global Centre for Disaster Protection funded by the DFID.



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Appendix 3: Nuclear Pools international pooling system via reinsurance reciprocation



Source: <https://www.nuclear-risk.com/nuclear-pools/>



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