



# EIOPA STAFF PAPER ON MEASURES TO IMPROVE THE INSURABILITY OF BUSINESS INTERRUPTION RISK IN LIGHT OF PANDEMICS



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ON MEASURES TO IMPROVE  
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## INTRODUCTION

1. The impact of the COVID-19 pandemic goes beyond the health sector and exhibits unprecedented socio-economic losses in the form of business interruption losses. As a result of the current pandemic crisis, the global economy is projected to decline by 4.4% in real GDP for 2020.<sup>1</sup> Further lock-down measures in effect in 2021 are likely to delay recovery. This vividly shows the interconnectedness of today's risk landscape, and the systemic nature of the pandemic crisis.
2. Industry estimates are that less than 1% of the estimated USD 4.5 trillion global pandemic-induced GDP loss for 2020 will be covered by business interruption (BI) insurance. This market segment generates annual premium income of about USD 30 billion (less than 2% of the world's property & casualty insurance market), with cover generally intended for and triggered by physical damage only. The insurability of pandemic business interruption risk according to traditional insurance models is being questioned and discussions are taking place on the responsibility for risk taking between the private insurance sector and the public sector.<sup>2</sup>
3. Issues around contractual terms relating to the scope of cover for non-damage business interruption losses under the pandemic have raised concerns in some markets.<sup>3</sup>
4. In addition, for the limited number of cases in which pandemic coverage for NDBI was offered, most (re)insurers seem headed towards excluding coverage for this risk going forward. In other business lines, the conditions surrounding coverage of pandemic risk are being closely examined. For example, Munich Re experienced a EUR 1.5bn loss in the first half of 2020 because of the COVID-19 pandemic, with the most significant losses related to the cancellation or postponement of major events. The company subsequently indicated they "are currently examining whether [they] will offer new contracts that include pandemic protection in property and casualty insurance in the future".<sup>4</sup>
5. Having regard to this insurance protection gap for non-damage business interruption (NDBI) in the context of pandemics, this paper focuses on measures that may contribute to improving insurability of business interruption. However, the challenges posed by the pandemic crisis require the sharing of costs and responsibilities across the relevant parts of the private and public sector in a meaningful manner, as well as some central coordination across public and private entities, as pointed out in EIOPA's Issues Paper on shared resilience solutions for pandemics.<sup>5</sup> Therefore, these measures have to be considered together with measures which individuals, businesses and governments should take, achieving a proper balance of incentives and respective responsibilities.

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1 IMF - <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020>

2 See the analysis by the Geneva Association (2020): An Investigation into the Insurability of Pandemic Risk. The report notes that the lack of randomness and independence of loss occurrence, the amount of the maximum possible loss and average loss make the coverage of pandemic business continuity risk highly problematic. The affordability of insurance and the definition of triggers for losses add to the complexity. <https://www.genevaassociation.org/research-topics/socio-economic-resilience/investigation-insurability-pandemic-risk-research-report>

3 See for example the UK Financial Conduct Authority Test Case <https://www.fca.org.uk/news/press-releases/result-fca-business-interruption-test-case>

4 Bloomberg report, September 2020 - <https://www.bloomberg.com/news/articles/2020-09-11/munich-re-stops-selling-pandemic-business-coverage-after-losses>

5 [https://www.eiopa.europa.eu/content/issues-paper-resilience-solutions-pandemics\\_en](https://www.eiopa.europa.eu/content/issues-paper-resilience-solutions-pandemics_en)

## EIOPA'S PRINCIPLES FOR SHARED RESILIENCE SOLUTIONS

1. A shared resilience solution would require the sharing of costs and responsibilities across the relevant parts of the private and public sector in a meaningful manner.
2. An efficient shared resilience solution will require an element of central coordination across public and private entities.
3. Any solution involving public and private sector would be conditional upon implementing efficient and effective prevention and adaptation measures.
4. A shared resilience solution can only insure against a portion of the economic costs.

6. This paper analyses in more detail options for **improving on the insurability of NDBI risk in light of pandemics** through:

- › **Prevention measures to reduce losses,**
- › **Capital markets risk transfer,** and
- › **Multi-peril solutions for systemic risk.**

7. A common challenge to risk prevention, capital market risk transfer and insurance schemes in the context of pandemics is the limited predictive quality of insurance models, especially with regard to the behavior of public or private entities and the socio-economic impact of a pandemic crisis beyond mortality and morbidity.
8. Insurance and capital market solutions for pandemics also suffer from the difficulty in defining relevant and objective triggers for claims, which would limit the risk of moral hazard and enable relevant pay out in a timely manner.
9. This paper analyses the issues and opportunities for risk prevention, capital market risk transfer and multi-peril risk pooling for systemic risk. The paper also addresses the general challenges related to modelling and triggers for claims in the context of pandemics.
10. The paper presents potential areas for further consideration, to contribute to the ongoing discussion. The paper is an EIOPA staff paper and does not necessarily reflect the opinions of all national supervisory authorities. The paper is based on discussions with and benefited from input from representatives of the insurance industry and commercial insurance buyers, including Insurance Europe, FERMA and Marsh&McLennan. It also benefited from input from Bipar, AMICE and the Reinsurance Advisory Board.
11. The paper also benefited from the Advice of EIOPA's Insurance and Reinsurance Stakeholder Group, whose

comments on EIOPA's first staff paper have been taken into account in drafting this second paper.<sup>6</sup>

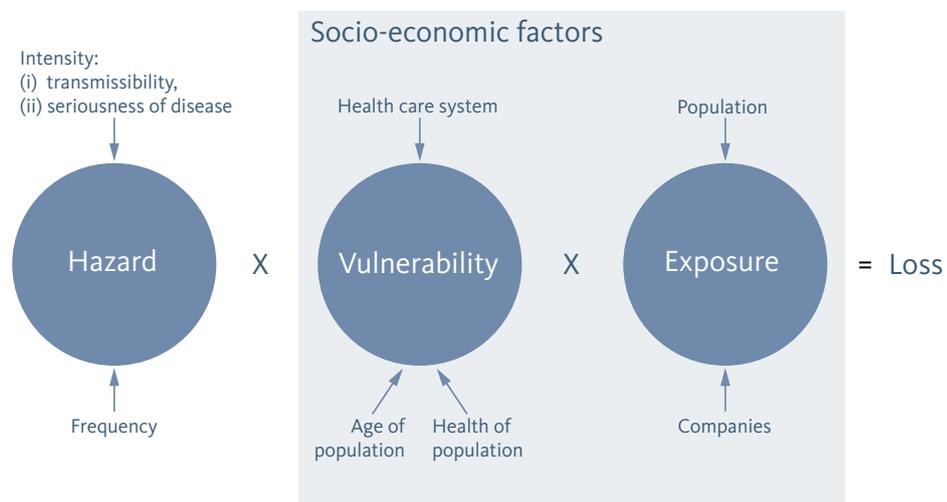
› **Views are invited on this issues paper until Wednesday 31 March 2021.**  
**Please send any comments to:**  
[sharedresiliencesolutions@eiopa.europa.eu](mailto:sharedresiliencesolutions@eiopa.europa.eu)

<sup>6</sup> <https://www.eiopa.europa.eu/content/irsg-advice-shared-resilience-solutions>, October 2020.

# REDUCING LOSSES THROUGH PREVENTION MEASURES

## 1. THE ROLE OF PREVENTION MEASURES

- 12. In the context of this analysis, prevention measures are defined as measures that aim at limiting non-damage business interruption losses that occur because of the pandemic or government response measures, and which directly or indirectly affect citizens and businesses.
- 13. Infectious diseases affect citizens' health (sickness, death, long-term health impairment); the economy at local, regional or global level (productivity loss); and exacerbate social risks ('equity and access', including access to digital and a safe social environment).
- 14. Loss is a combination of three components: hazard, exposure and vulnerability.<sup>7</sup>
- 15. Prevention measures can aim at minimizing the intensity or impact of the hazard (limiting spread of the disease or mortality) and control losses from a socio-economic perspective, focusing on measures that address the society's vulnerability (population's health or age, health care system) and exposure (number of individuals, businesses).
- 16. Short-term relief measures to address the economic losses to businesses from pandemic risk are crisis management-type of measures. These typically require immediate payout of large sums for events whose risk it is usually difficult to measure, and depend on circumstances. These measures are less risk-based, aiming at paying out lump sums to cover a given percentage of losses in a non-bureaucratic manner 'to enable survival'. Often, this is where governments step in, in the absence of other - (self-)insurance - solutions.
- 17. Over a medium-to-longer term, based on available



- 15. Prevention measures can aim at minimizing the intensity or impact of the hazard (limiting spread of the disease or mortality) and control losses from a socio-economic perspective, focusing on measures that address the society's vulnerability (population's health or age, health care system) and exposure (number of individuals, businesses).
- 18. Prevention measures can be taken directly by individuals and businesses (e.g. social distancing, wearing of protective masks, implement business contingency plans as part of enterprise risk management, in line with international standards such as, for example, ISO 22301). Where relevant, they can be promoted by pri-

<sup>7</sup> Based on Swiss Re, 2020. Natural catastrophes in times of economic accumulation and climate change. Sigma 2/2020.

vate market participants such as insurers (e.g. insurance policies incentivizing health at work or business continuity planning), while some measures are largely in the remit of public authorities (e.g. investment in health security or containment measures to prevent disease spreading).

19. Individuals and businesses have different possibilities for taking risk prevention measures depending on their sector, size or financial capacity.
20. The COVID-19 pandemic crisis has shown how certain prevention measures themselves may (in)directly cause losses, also called the cost of response and recovery (or 'secondary effects'). Containment measures that are aimed at preventing spreading of the disease can cause socio-economic damage, in particular business disruption losses in the form of business revenue losses. Such secondary effects can cause direct losses affecting directly businesses required to close under a lockdown, or indirect losses, which are suffered through supply-chain disruption because of the lockdown. The majority of business interruption losses related to COVID-19 pandemic crisis can be attributed to these secondary effects.
21. In that case, so-called 'ex post prevention' - or rather redress - measures aim not only at covering losses caused by epidemiological threat (disease and mortality), but also the socio-economic cost brought by the exact measures to contain disease and mortality. This includes for example public social benefit and furlough schemes (incl. funding for short-time work, grants) to support those directly or indirectly affected. Most public and private proposals for solutions to losses caused by COVID-19 focus today on business interruption losses (see: Annex I).

## 2. CHALLENGES TO INVESTING IN PREVENTION MEASURES

22. Two important challenges exist when it comes to identifying the right prevention measures and investing in these measures in an efficient manner across society.
23. One of the challenges is the lack of relevant data and limited predictive capacity of insurance models when it comes to assessing socio-economic and behavioral risks under a pandemic, beyond mortality and morbidity. This is a broader challenge in dealing with pandemic risk and not limited to the identification of prevention measures.
24. Based on better modelling and pricing, more targeted incentives for prevention, which would take into account expected vulnerability and behavior of individuals, businesses and public authorities, could be taken.

## MODELLING OF SOCIO-ECONOMIC IMPACT AND BEHAVIOURAL DYNAMICS TO IMPROVE ON PREVENTION, RISK TRANSFER AND POOLING

25. To provide relevant, objective and targeted incentives for prevention as well as incentivize risk transfer to capital markets and pooling arrangements, improvements to the modelling of pandemic risks are needed. More predictive models for pandemic risks, not only focused on mortality and morbidity, but including socio-economic and behavioral risk assessment can contribute to this, taking into account expected socio-economic vulnerability and behavior of individuals, businesses and public authorities.
26. As an example, the COVID-19 pandemic crisis has revealed the particular socio-economic vulnerability of certain parts of society to the pandemic, more specifically to the response measures taken by public authorities. SMEs and self-employed are above average affected by (the response measures to) the pandemic, in specific sectors, including: transport manufacturing, construction, wholesale and retail trade, accommodation and food services, real estate, professional services, and other personal services (e.g. hairdressing). The effect on SMEs is especially severe, particularly because of higher levels of vulnerability (on demand and supply side) and lower resilience related to their size (incl. financial capacity). The smaller nature of the SME business and limited financing and diversification capacity means that recovery is challenging and heavily dependent on cash flow.<sup>8</sup> Large companies, who are better financed, are increasingly considering “self-insuring”, for example via captives, and may have better access to government financing (“too big to fail”). Many of the measures implemented to sustain businesses through the Covid-19 crisis consisted of debt financing. Consequently, SME debt may rise significantly. This socio-economic analysis should drive the identification and implementation of prevention measures.
27. This requires access to public and private data on the exposure and vulnerability of the policyholders/society, at a great level of granularity, differentiating between sectors, sizes, and having regard to regional or local specificities.<sup>9</sup> It also requires modelling the potential response measures of public authorities, e.g. local or regional lockdown measures or the existence of public schemes for financial support.
28. Where standardized responses to pandemic surges are emerging, a pre-determined set of restriction measures or at least commonly agreed indicators, using socio-economic and behavioural metrics beyond health, could improve predictability of response mechanisms, and help reduce public uncertainty, increase social acceptance of the restrictions and responsibility for prevention. Of course, future pandemics may require different types of responses, but common parameters may be one important step in the right direction.
29. Including scenarios of decreasing public intervention over time, debt repayment pressure mounting and increasing insolvencies leading to more structural/macro financial distress will increase the predictive nature of the modelling and the potential for targeted response measures.
30. In addition to the modelling of epidemiological risk drivers as well as socio-economic and behavioral dynamics, it may be relevant to define also ‘what-if scenarios’ to reflect the increasing of other risks, which can unfold: for example the increased incidence and/or impact of cyber-attacks where increasing reliance is put on digital working methods (‘home office’). This way, prevention can be reinforced not only for the risk of a pandemic and its containment measures, but also for ‘following’ risks (e.g. preventive investment in cyber security) and common prevention measures can serve multiple risks, resulting in synergies and cost efficient solutions.
31. Furthermore, by including socio-economic and behavioral dynamics, options can unfold for targeting more effectively prevention measures to certain sectors or regions or pooling risks across regions or sectors, paving the way for different types of pooling arrangements.
32. To improve the data availability and analytics, open source models, supported by digital analytical tools can improve the measurement of the exposure and vulnerability to the hazard as well as the (impact of) response and recovery measures. Open access to data and sharing of analysis should enable modelling for risk management purposes, as well as informing national prevention standards or investments in structural adaptation infrastructure aimed at long-term reconstruction, and enable aligning public and private initiatives – i.e. reduce moral hazard.

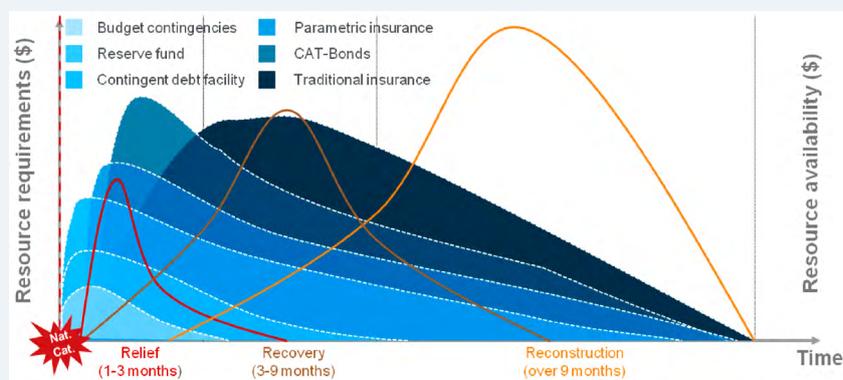
8 See OECD, <https://www.oecd.org/coronavirus/policy-responses/evaluating-the-initial-impact-of-covid-19-containment-measures-on-economic-activity-b1f6b68b/>, June 2020, and SME Policy Responses, updated 15 July 2020. <http://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101/>. Revoltella, Maurin and Pal, June 2020, find that in the European Union, cumulative net revenue losses for companies in a 3 months lockdown scenario amount to 13-24% of GDP, with over half of firms facing liquidity shortfalls even after substantial policy intervention. SMEs face larger revenue losses than larger firms as a percentage of total assets (6-11% for SMEs, 2-4% for larger firms), <https://www.eib.org/en/stories/economic-recovery-after-coronavirus>

9 Aerts, J.C.J.H., Botzen, W.J., Clarke, K.C. et al. Integrating human behaviour dynamics into flood disaster risk assessment. *Nature Clim Change* 8, 193–199 (2018). <https://doi.org/10.1038/s41558-018-0085-1>

33. The second challenge relates to **moral hazard**. Generally, behavioral bias leads to reduced risk awareness, limited offer and take-up of insurance and reduced incentives for taking prevention measures, even where these prove economically beneficial. Under bounded rationality, individuals tend to underestimate the probability of an event to occur, fall back on availability heuristics, ignore information about extreme risk, are biased towards the present, anticipate significant ad hoc help from the government (charity hazard), and tend to be rather optimistic when it comes to the future.
34. More specifically, behavioral dynamics between public and private organizations may also lead to suboptimal risk transfer and risk prevention: moral hazard can lead to public authorities relying on private initiative (e.g. a decision for government containment measures for a pandemic can be influenced by the degree to which affected businesses are insured and governments may have an interest in extending containment measures if losses are covered by insurers). The offer of private insurance solutions is as likely to be affected by the degree to which public financial support is expected to kick in. The lack of predictability of government intervention under the current pandemic crisis is being mentioned as one of the key obstacles in securing insurance solutions, which can be seen as a behavioral obstacle to aligning prevention action between public and private entities.
35. Contractual as well as regulatory incentives for prevention measures in ‘traditional’ indemnity-based insurance solutions can only address part of these obstacles. In addition, there are limits to a risk-based approach in insurance as this can render insurance unaffordable (higher risk, higher premium). Therefore, more innovative solutions are required, including public-private solutions for aligning prevention and risk transfer incentives – introducing where relevant elements of solidarity - as well as potential regulatory measures to support investment in prevention.
36. Furthermore, objective and relevant **parameters for triggering claims** could counter moral hazard for policyholders, insurers and public authorities, as well as limit basis risk for investors. While this is relevant for designing relevant prevention measures, parametric claim triggers can also be relevant in the context of involving capital markets.

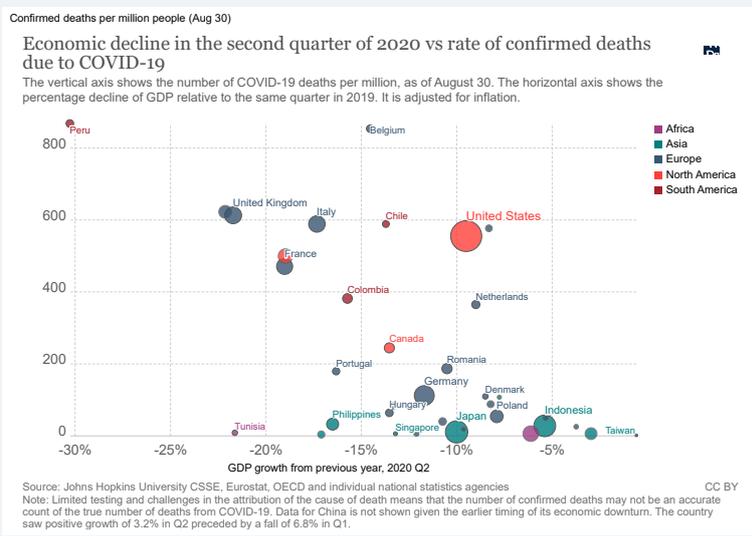
## PARAMETRIC INSURANCE FOR PANDEMICS

37. Parametric insurance is a type of insurance covering the occurrence of a pre-defined external event, instead of indemnifying the actual losses incurred by the policyholder. Classical indemnity triggers are not ideally suited to the urgent cash requirements associated with NDBI losses during pandemics. Claims linked to the actual business losses incurred take time to be properly filed, assessed and processed, in particular in the context of a pandemic where a massive amount of claims would be introduced at the same time. Parametric claim triggers allow in principle for a quicker distribution of funds and may be more suitable for immediate pandemic relief. This is illustrated in the graph below, which applies to natural catastrophe relief, recovery and reconstruction measures:



Source: OECD, Ernst Rauch (Munich Re), 2018, Developing the elements of a disaster risk financing strategy – Conference Outcomes, <http://www.oecd.org/pensions/insurance/Developing-elements-of-disaster-risk-financing-strategy-May-2018-conference-outcomes.pdf>

- 38. In the context of a pandemic, parametric insurance solutions have been implemented in the past (see: case study on Pandemic Emergency Financing Facility below). They are also being considered in proposals for future insurance schemes in light of COVID-19 (see Annex I), as well as in discussions around Alternative Risk Transfer and ILS (see: section on alternative risk transfer).
- 39. The corresponding parametric triggers are generally associated with epidemiological metrics (e.g. infection rates, fatalities) and/or containment decisions from the authorities (e.g. legally ordered lockdown measures, declaration of a state of pandemic emergency by the WHO etc.). They can be combined with claims attestation based on self-certification by the policyholder.
- 40. Parametric triggers linked to public health metrics (such as the number of cases, for example) can appear more objective and less fraught with uncertainty than classical insurance solutions. However, there is a trade-off in terms of loss coverage. The simpler the parametric trigger, the less likely it is that it will coincide with the real losses incurred by policyholders (basis risk). This can be seen for example in the fact that the impact on GDP across countries is not univocally correlated with the number of Covid-19 deaths or cases per capita.



Source: Our World in Data

- 41. In reality, the number of cases is not an absolute and objective measure, as it depends on testing capacity, public health policies, and national methodologies used to compile statistics. For example, among the countries who withstood the first waves of Covid-19, some have relied on widespread testing (e.g. Iceland) while others have relied on other measures and limited testing (e.g. Japan). Even the number of deaths is not fully comparable between countries, as practices vary around the counting of deaths at home, in retirement homes, and for patients with multiple co-morbidities (e.g. already suffering from diabetes, obesity or cancer in addition to Covid-19 at the time of passing away).
- 42. Parametric triggers based on government measures carry an inherent basis risk as well. The actual business interruption losses are not directly linked to the pandemic itself, but to society's reactions to its spreading (whether following government intervention or through people spontaneously reducing their level of economic activity because of risk aversion in a public health emergency).
- 43. Triggers linked to state intervention are also associated with potential moral hazard issues. Large NDBI losses have been caused by the containment decisions of governments. Political or financial considerations may factor in in the state decisions about whether and when to take measures. The link between official pandemic status declaration and the need for the state to provide financial aid accordingly has been highlighted (for example in Slovenia during the first wave of Covid-19<sup>10</sup>). Governments may rely on the existence of insurance in taking decisions, and insurers as well as policyholders may not be incentivised to invest in prevention as they can hardly

10 See [https://en.wikipedia.org/wiki/COVID-19\\_pandemic\\_in\\_Slovenia#May\\_2020](https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Slovenia#May_2020)

influence the (impact of the) scope and duration of the containment measures. An appropriate waiting period could also help to encourage risk prevention measures.

44. Finally, parametric triggers based on public measures carry legal uncertainties for enforcement. For example, is a curfew covered under a parametric clause referring to lockdowns? What about regional or sectoral lockdowns? A further difficulty lies in the prolonged nature of pandemics, developing in several waves over many months or even years, as opposed to classical catastrophes like hurricanes or earthquakes which are over in a matter of days and can be assessed comparatively swiftly.

45. The issues of basis risk and moral hazard associated with pandemic insurance have also been observed in other areas than pandemics.

46. Despite these issues however, foregoing parametric solutions altogether in favour of classical indemnity-based solutions would miss out on benefits to provide quick relief to affected businesses and clarity on disbursement parameters. Parametric solutions can also offer further prevention incentives: for example for crop insurance, a farmer with a parametric insurance contract which pays out if rainfall falls below a pre-defined level, can gain doubly by planting drought-resistant crops since the farmer will have lower losses and still receive a pay-out.<sup>11</sup>

47. Further work is therefore needed to improve legal certainty, predictability and swiftness in claims payment, together with the capacity of properly incentivising risk prevention. The definition of adequate parametric triggers for claims disbursement needs further careful thought

48. The following sections address **contractual risk-based incentives**, as well **as areas for consideration for regulatory measures to improve insurability**. Following this, the paper sets out examples of measures aligning prevention incentives through public-private cooperation.

<sup>11</sup> Linnerooth-Bayer J., Surminski S., Bouwer L.M., Noy I., Mechler R. (2019) Insurance as a Response to Loss and Damage?. In: Mechler R., Bouwer L., Schinko T., Surminski S., Linnerooth-Bayer J. (eds) Loss and Damage from Climate Change. Climate Risk Management, Policy and Governance. Springer, Cham, [https://link.springer.com/chapter/10.1007/978-3-319-72026-5\\_21](https://link.springer.com/chapter/10.1007/978-3-319-72026-5_21)

### 3. RISK PREVENTION THROUGH TRADITIONAL INSURANCE AND PUBLIC-PRIVATE SOLUTIONS

#### Risk-based incentives for risk prevention through traditional insurance

49. Traditional insurance incentives for risk prevention by the policyholder include deductions, limitations or waiting periods, which form part of the terms and conditions of the insurance contract.
50. **Clarity on the sources of loss** in policy wordings, the **extent of coverage, limits and exclusions**, supported by the assessment of customers' needs to identify the key elements of coverage, is an important element to contribute to legal certainty and adequate coverage. Clarity in the communication on these measures in the sale/distribution of the product, as well as the possibility for policyholders to decrease a deductible or adapt limitations, can further incentivize risk reduction behavior by the policyholder.
51. However, clarity on the wording can only achieve that much: the risk of tighter contract wording – more exclusions – is increasing following the COVID-19 crisis.
52. Insurers can improve policyholders' risk awareness and incentive to invest in risk prevention by showing the **true cost of the risk**. Based on sound actuarial principles, risk-based premiums can contribute to that.<sup>12</sup>
53. Comparing the cost of insurance with and without risk prevention measures, and reflecting this difference in the insurance premiums, will inform the policyholder of the opportunity cost of investing in risk reduction.<sup>13</sup> Even where insurance premiums are subsidized by public measures, transparency to the insured of the true cost of the covered risk can be ensured, for example using government vouchers. Insurance intermediaries can contribute to create awareness about preventive measures and raise client awareness of the need (and/or availability) of insurance.
54. Insurers can make premium reduction conditional on further requirements, which may include risk inspections or business continuity planning by the insured, or offer additional insurance services (risk assessment service, consultancy) to support the risk reduction incentive. Such insurance services will also carry additional distribution or administrative costs, which will have to be factored in the ultimate cost of insurance. If the policyholder is incentivized to invest in risk prevention measures, this will be to the benefit of the insurer, who can benefit from a reduced risk of losses.
55. A useful analogy can be made with the experience of prevention measures for natural catastrophes, such as flood disasters. Reasons for households to invest insufficiently in protecting their property from flood disasters, even when such measures are economically efficient, include lack of risk awareness, underestimation of the risk in the absence of recent experience of the hazard, and the use of short term planning horizons in risk management. Risk reducing measures in this case include early warning systems to reduce exposure, construction measures to protect critical infrastructure to reduce hazard probability or vulnerability (e.g. building codes). Research has shown that individuals implement prevention measures if they believe that the threat of the hazard is high, available protection measures are effective, easy and affordable to implement.<sup>14</sup>
56. An important prevention measure for reducing NDBI losses under a pandemic, which can be promoted through insurance, is the requirement for business continuity planning from insured businesses, as part of the relevant insurance product. For example, policyholders' business continuity planning for loss of revenue caused by containment measures or ensuing supply chain disruption can support reducing credit insurance claims. In this case, a credit insurer can support businesses with buyer/sectoral risk assessment or the identification of counterparties that may be particularly prone (or not) to default under pandemic-related measures.

<sup>12</sup> EIOPA Discussion Paper on underwriting and pricing in light of climate change. Under consultation: <https://www.eiopa.europa.eu/content/ensuring-availability-and-affordability-of-insurance-light-of-climate-change-discussion>).

<sup>13</sup> Climate change adaptation in insurance, Scholer, M., Schuermans, P. (forthcoming).

<sup>14</sup> Aerts, J.C.J.H. et al., op.cit.

### Regulatory incentives for risk prevention

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57. As of today, there is hardly a market for NDBI insurance coverage in the context of pandemics – for the reasons outlined in the July 2020 EIOPA issues paper on shared resilience solutions<sup>15</sup> – and exclusions are likely to increase as a ‘lesson learnt’ from the COVID-19 pandemic. Therefore, there is limited scope to introduce risk prevention measures as part of existing insurance products, at this stage.
58. In the current prudential and conduct regulatory framework, insurers are not required to assess **affordability of insurance** for vulnerable parts of society. In light of systemic risks, risk-based pricing has its limits: as hazards are more severe and/or more frequent and losses increasingly connected, insurers choose to charge higher premiums or stop offering coverage. Insurance may become unaffordable.
59. If concrete steps are to be made to close the protection gap for NDBI insurance coverage for pandemics, there may be a need for other incentives, besides risk-based premiums, or regulatory requirements, to strengthen risk prevention.
60. Further consideration may therefore be given to regulatory or supervisory requirements for
- promoting risk prevention requirements for the policyholder through product oversight and governance requirements, subject to cost-benefit analysis by the insurer and regulators;<sup>16</sup>
  - assessment of insurers’ business plans or underwriting strategy where agreed national or local prevention plans have been implemented;
  - securing operational and financial resilience of (re)insurers offering NDBI insurance going forward, such as the quality of (re)insurers’ own funds, underwriting and accumulation management as well as the quality of the internal models and scenario analysis that are being used, including from third party providers.<sup>17</sup>
61. Consideration could be given to whether insurers, who effectively and measurably integrate risk prevention measures in their underwriting and pricing, could

benefit from capital reduction or other regulatory incentives.

62. Also, it can be discussed whether direct investment by insurers in critical infrastructure that contributes to limiting NDBI losses from pandemics can be regarded as a prevention measure, and whether this can be considered in the regulatory treatment of the insurer, or financial market participants.
63. As a matter of better regulation, regulatory initiatives for prudential or conduct purposes, may need to explicitly assess the impact of regulation on prevention of losses, where relevant.
64. Finally, as part of risk management practices of undertakings, the practice of self-insurance, possibly via captives, can also improve resilience to risks.

### Public-private solutions to align incentives for prevention measures

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65. Based on the experience of public-private pooling mechanisms for ‘large or systemic’ risk and having in mind the current lack of private insurance solutions for NDBI pandemic losses, current initiatives for pandemic NDBI risk solutions across countries are largely based on public-private frameworks. Public intervention can help in meeting ‘immediate’ coverage gaps and introduce an **element of solidarity** that goes beyond traditional insurance mutualisation.
66. As part of such public-private initiatives, measures can be taken to align public-private incentives for risk prevention, reducing moral hazard.
67. Traditional insurance solutions are based on the concept of mutualisation of risk among the insured. Private insurance solutions hence have limited capacity to improve broader societal resilience to global/systemic risk, as losses are shared only within the at-risk community (disregarding the possibility of premium cross-subsidization between low risk/wealthy clients being charged higher premiums to make insurance affordable for high risk/low-income clients).<sup>18</sup>
68. In some instances, public insurance solutions can also be more conducive to preventative risk reduction than mere private solutions. As an example, for a very similar natural hazard prevention product, it has been observed that state monopolies charge 70% lower prices, that they spend substantially more on fire prevention, and that they have much lower damage rates. One of the main reasons cited for the higher prices of the pri-

<sup>15</sup> See [https://www.eiopa.europa.eu/content/issues-paper-resilience-solutions-pandemics\\_en](https://www.eiopa.europa.eu/content/issues-paper-resilience-solutions-pandemics_en)

<sup>16</sup> EIOPA discussion paper on underwriting and pricing in light of climate change, op. cit.

<sup>17</sup> Richter, A. and Wilson, T., Covid-19: implications for insurer risk management, *The Geneva Risk and Insurance Review* (2020) 45:171–199. <https://doi.org/10.1057/s10713-020-00054-z>.

<sup>18</sup> Linnerooth-Bayer J., et al., op.cit.

vate insurance companies is the fact that they spend considerably more on sales and administrative costs.<sup>19</sup>

69. Different solutions can be built in in public-private mechanisms to **align public and private interests** for investing in prevention:

- Public intervention can be made conditional upon the implementation of prevention and adaptation measures through insurance, which have been previously agreed among public and private actors. As an example, in France insurability of natural catastrophe risk is made conditional upon compliance with Risk Prevention Plans (Plan de Prevention des Risques, PPR).
- An increasingly high threshold for public intervention can apply over time, to promote private (insurance) market initiative for risk-based pricing.
- Repayment of public intervention, deductions from claims payment for government support or advance agreement on the type of expenses to be covered by public or private authorities, respectively (e.g. operating expenses, such as rent, utilities, insurance,... to be covered by private insurers, excluding social benefits or salaries, which are covered by social arrangements and furlough schemes).
- To develop the risk management culture by undertakings, tax incentives on risk management measures, as well as subsidized, publicly available educational or accreditation programmes or training in public-private cooperation, e.g. for SMEs, could help businesses in taking ownership of risk prevention and risk management to remain competitive and resilient. Some initiatives exist in some Member States such as [macartodesrisques.fr](http://macartodesrisques.fr) developed by French risk management and business associations AMRAE and MEDEF for a free-of-charge high-level assessment of businesses risk assessment.<sup>20</sup> Or for example, the government-backed Cyber Essentials scheme in the UK.<sup>21</sup>

70. There are relevant examples, for other perils than pandemics of different types of public-private cooperation, where **prevention measures are explicitly included**:

19 Von Ungern-Sternberg, T., The limits of competition: Housing insurance in Switzerland, *European Economic Review*, Volume 40, Issues 3-5, 1996, Pages 1111-1121, ISSN 0014-2921, [https://doi.org/10.1016/0014-2921\(95\)00119-0](https://doi.org/10.1016/0014-2921(95)00119-0). Schwarze, R., Croonenbroeck, C. Economies of Integrated Risk Management? An Empirical Analysis of the Swiss Public Insurance Approach to Natural Hazard Prevention. *EconDisCliCha* 1, 167-178 (2017). <https://doi.org/10.1007/s41885-017-0014-1>.

20 <https://www.macartodesrisques.fr/>

21 <https://www.ncsc.gov.uk/cyberessentials/overview>

- France: The Mission Risqué Naturels (MRN) is a private insurance initiative of the French insurance industry to improve knowledge and prevention of climate risks, and collaborate with public authorities on prevention policies. Insurers participate through the MRN in state initiatives for prevention measures, including for risk assessment, public risk prevention policy financing, lessons learnt and event analysis, assessment of public policy tools. The initiative supports networking and partnerships with communities, promoting public data on hazards, geolocation of risks or studies in partnership with public actors.<sup>22</sup> Prevention measures are funded with the intervention of the 'Major natural hazards prevention fund' (FPRNM, 'Fonds Barrière').

- UK: Pool Re is a public-private scheme to cover commercial property damage caused by acts of terrorism. If policyholders have 'exercised risk management', they would be eligible for premium discounts (via a vulnerability self-assessment tool). Flood Re is a not-for-profit temporary reinsurance company, where the government agreed in its establishment to invest in flood mitigation measures on an ongoing basis to enable transition to a private insurance market.

- Switzerland: The Swiss Kantonale Gebaudeversicherung (KGV) are independent non-profit monopoly insurers under cantonal public law, responsible for property insurance in their cantons (mandatory insurance), and at the same time, responsible for damage prevention, regional fire and emergency services, i.e. carrying out public authority tasks.<sup>23</sup>

71. Applied to the NDBI risk, such schemes may improve risk management by private and public entities. In a public-private constellation, insurers could provide risk assessment to public actors, so these can take risk-based decisions, which are potentially more targeted and less costly. This could make the losses more predictable or less random, improving on the insurability of the risk. Eventually, both private and public risk management will be better informed and moral hazard limited.

72. The mechanism of co-insurance, whereby public authorities take part of the risk from the moment losses arise, for a given percentage as well as the use of semi-parametric triggers for claims payment may contribute the reducing moral hazard. In addition, ex-

22 Similar institutions have been created in the US (the Institute for Business and Home Safety, IBHS), Canada (the Institute of Disaster Loss Reduction, ICLR) as well as similar projects in DE (ZURS GEO), AT (HORA), CZ (FRAT).

23 Schwarze, R., Croonenbroeck, C., op. cit.

amples of existing regional pooling mechanisms and micro-insurance solutions for developing countries can inform the design of sectoral pooling mechanisms that would address particular socio-economic vulnerabilities under the current pandemic crisis in Europe.

73. **Pooling of risks across sectors or regions** that are particularly affected by the socio-economic risks of the pandemic may create improved awareness and allow for cross-sectoral diversification of risks. For example, the R4 Rural Resilience Initiative (R4) is an initiative in cooperation between farmers, local relief societies, insurers, reinsurers, rural banks, universities, government and donors to offer micro-insurance for drought risk to food-insecure communities in Ethiopia, Senegal, Malawi and Zambia. In lieu of paying a premium, cash-constrained farmers can opt to participate in an insurance-for-assets (IFA) plan, whereby they pay the

premium through their labour on projects that reduce risk in the community, such as field irrigation projects or tree planting. In addition, premiums are subsidized to further support those most vulnerable to reduce their own risk and to change their behaviour.<sup>24</sup>

74. **Public-private co-insurance**, whereby governments take part of the risk from the moment losses arise, for a given percentage may further improve alignment of risk reduction incentives between public and private actors, including insurers and policyholders. Public authorities acting as direct insurers, together with private insurers could limit the issues of allocating accountability for taking response and recovery measures. (See Annex I. Reference is made to the proposal for the US Pandemic Business Interruption Program).

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<sup>24</sup> Linnerooth-Bayer J., et al., op.cit.

# IMPROVING RISK TRANSFER CAPACITY THROUGH CAPITAL MARKETS

75. To improve society's capacity for bearing pandemic risk beyond traditional insurance mechanisms, further consideration can be given to Alternative Risk Transfer (ART) solutions. This section examines how international capital markets could be used as part of a shared resilience solution for covering NDBI losses in the context of pandemics.

## 1. THE ROLE OF CAPITAL MARKETS IN RISK TRANSFER FOR PANDEMIC RISKS

76. Reinsurance capacity, provided by private reinsurers or enhanced through government backstop schemes, is one of the key building blocks for designing a sustainable risk coverage mechanism. However, there is currently very **limited appetite from the reinsurance markets** for retaining pandemic NDBI risk. This is due to the obstacles to insuring pandemics-related NDBI as referred to above, and in particular to the difficulty to diversify the risk.<sup>25</sup>

77. In the absence of sufficient and affordable reinsurance capacity, there is a potential role for ART mechanisms using capital markets. The total capital base of the global commercial non-life (re)insurance industry is around USD 2tn, while the size of global capital markets is estimated at around USD 180tn.<sup>26</sup> Only a very small proportion of this capital is currently used to take on insurance risk as a diversifying investment to market risk.

78. Ceding excess risks to capital markets is typically done by reinsurers. It can also be done directly by sophisticated primary insurers, or by government agencies who cover pandemic risk through subsidization mechanisms and who seek to protect public finances and

taxpayers. Some of the EU instruments for pandemic recovery under the Next Generation EU long-term budget measures will also seek to raise additional financing in the financial market<sup>27</sup> (although without embedded insurance risk transfer), as do some of the various insurance industry proposals currently discussed in the USA (see: Annex I).

79. ART mechanisms such as Insurance-Linked Securities (ILS) could thus provide an additional layer of risk transfer and diversification in addition to or in replacement of traditional (re)insurance solutions.

## 2. INSURANCE-LINKED SECURITIES, CATASTROPHE BONDS AND OTHER MECHANISMS

80. **Insurance-Linked Securities (ILS)** are traded financial instruments whose value and cash flows are linked to insurance loss events. They provide additional contingent capital to (re)insurers in case of covered losses. For investors, ILS are an alternative asset class whose main appeal is as a source of market risk diversification, as their returns are generally uncorrelated with the rest of the financial markets.

81. ILS typically involve the intervention of investment banks to create Special-Purpose Vehicles (SPV), through which (re)insurers cede premiums and risks associated with a book of (re)insurance business to investors. This makes ILS a risk transfer mechanism which can be expensive and complex to set up, more so than a conventional reinsurance contract or than the straightforward issuance of debt. In order to attract appetite from investors, ILS also need to be designed in such a way that their expected risk and return pro-

<sup>25</sup> See Geneva Association (2020), op. cit.

<sup>26</sup> Lloyds, 'Supporting global recovery and resilience for customers and economies: the insurance industry response to COVID-19', July 2020 - [https://www.lloyds.com/~/\\_media/files/news-and-insight/coronavirus-hub/covid-white-paper/lloyds\\_covid-19\\_white-paper\\_final2.pdf](https://www.lloyds.com/~/_media/files/news-and-insight/coronavirus-hub/covid-white-paper/lloyds_covid-19_white-paper_final2.pdf)

<sup>27</sup> [https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe\\_en](https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/recovery-plan-europe_en)

- file is attractive. This makes them a tool, which is not always adapted and cost-effective in every situation.
82. The segment of the ILS market covering high-severity, low-probability events is known as **catastrophe (CAT) bonds**. CAT bonds are high-yield debt instruments designed to provide additional funding for (re)insurers in the event of a natural disaster. Earthquakes or hurricanes are the typical examples of perils covered by CAT bonds. CAT bonds can be issued by private (re)insurance companies but also on occasion by sovereign states, as is the case for example for the Philippines earthquake and typhoon bonds listed on the Singapore stock exchange in 2019<sup>28</sup>.
83. Pandemic bonds are a specific (and currently marginal) sub-category of CAT bonds. One such example is the World Bank's Pandemic Emergency Financing facility (see: case study below).
84. Classical fully-funded CAT bonds (i.e. where investors can potentially lose all their money) are not the only possibility to transfer pandemic risk to capital markets. Other hypothetical solutions may make use of partially funded schemes where the private investors are only liable for a portion of the losses. A possible idea mentioned by a market participant<sup>29</sup> could be a **public-private partnership pandemic fund arrangement structured in several tranches**, with the first layer of the risk absorbed by insurers and external investors, and the remaining losses funded by governments or similar supra-national entities. This would mirror the government backstop provided in several existing terror reinsurance pools, or in a number of PPP schemes envisaged for pandemic risk (see Annex I). This pandemic fund would be a leveraged structure (possibly of investment grade rather than high-yield) where investors' money would be backed by government funding in order to provide additional capacity. However, these solutions are currently not being offered on the market and its design would require close collaboration between public authorities, capital market participants and ceding (re)insurers, as part of a shared resilience solution.
85. Capital markets can also be used for pandemic relief financing in simpler ways than ART and ILS. For example, they can be involved through the issuance of traditional bonds whose proceeds are earmarked to finance investment in prevention measures, based on a similar principle as Green Bonds or Social Bonds. In October 2020, the European Union issued EUR 17bn of SURE (Support to mitigate Unemployment Risks in an Emergency) **social bonds**<sup>30</sup>, with an ultimate aim of issuing EUR 100bn until 2021. These social bonds were oversubscribed, with a majority of buyers being ESG (Environmental, Social & Governance) investors. The funds raised will be allocated to the beneficiary Member States to help them cover short-time work schemes or similar measures designed to protect employees and self-employed, and on an ancillary basis to finance health-related measures (in particular in the workplace). Beneficiary Member States will each need to maintain this funding in a dedicated account and report on the use for the eligible social expenditures in 6-monthly instalments.
86. Issuance of government debt from states who have injected large amount of money into the economy because of Covid-19 is sometimes also described as 'pandemic bonds'. However, it is not an insurance mechanism-related but simply refinancing after the losses have already materialized. It is also not a shared solution as all costs (with the exception of sovereign credit risk ceded to lenders) are borne by governments. Outside of pandemic risk specifically, there are other precedents for international collaborations such as SEADRIF (South-East Asian Disaster Risk Insurance Facility)<sup>31</sup>. SEADRIF was established in 2019 as a platform for ASEAN countries to strengthen financial resilience against disasters and climate shocks. It is co-financed by several governments.

28 <https://www.air-worldwide.com/blog/posts/2019/12/historic-philippines-catastrophe-bond-helps-address-the-protection-gap/>

29 The Insurer, 'Life and Health Capital Market Investors to be Pivotal in Future Pandemic Hedging Solutions', Luca Tres, May 2020 - <https://www.theinsurer.com/viewpoint/life-and-health-capital-market-investors-to-be-pivotal-in-future-pandemic-hedging-solutions/8601.article> (subscription required for access)

30 [https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/financial-assistance-eu/funding-mechanisms-and-facilities/sure\\_en](https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/financial-assistance-eu/funding-mechanisms-and-facilities/sure_en)

31 <https://www.seadrif.org/>

**CASE STUDY: PANDEMIC EMERGENCY FINANCING FACILITY (PEF)<sup>32</sup>**

- Following the 2014-2016 Ebola outbreak in West Africa (Guinea, Liberia, Sierra Leone), the World Bank launched the Pandemic Emergency Financing facility (PEF) in 2016, in collaboration with the World Health Organisation (WHO). It aimed at financing the surge response in a pandemic crisis (but not preparedness efforts) for 76 of the world's poorest countries. Six categories of viruses were covered (including coronaviruses).
- The facility comprised a cash window (funded by Germany, Australia, Japan, and the World Bank) designed for immediate response, as well as an insurance window (CAT bonds and insurance-linked swaps issued by the World Bank with a 3-year maturity) as a secondary response mechanism. The two windows were complementary, with the cash window designed to cover emergencies not eligible to the insurance window.
- The insurance window was based on a set of multiple parametric triggers to be met (including the number of eligible countries affected; the number of cases in each country; the number of deaths; the ratio of confirmed cases to total cases, including suspected; and the growth rate of cases). The parameters used publicly available data published by the WHO, and were monitored by risk model vendor AIR Worldwide. For viruses other than the flu (which had its own distinct trigger parameters), the initial measurement of the growth rate took at least 12 weeks after the designated start of the event, after which it repeated on a rolling 12-week basis.
- Stringent trigger criteria were designed to ensure bonds/swaps secured sufficient return to attract investors' appetite and to ensure complementarity with other financing instruments such as WHO's Central Emergency Response Fund. Bonds/swaps paid a 6.5% p.a. spread for Class A bonds/swaps (influenza and coronavirus) and 11.1% p.a. spread for the riskier Class B bonds/swaps (filovirus, coronavirus, Rift Valley fever, Lassa fever, Crimean-Congo haemorrhagic fever). Pandemic bonds were issued in 2017 (in collaboration with Swiss Re, Munich Re and Guy Carpenter) and oversubscribed. A total of USD 320m of bonds and USD 105m of swaps were sold to private investors, pension funds, insurers and reinsurers.
- Prior to COVID-19, payments from the insurance window had not been triggered. The 2018 Ebola outbreak in Democratic Republic of the Congo did not meet the multi-country trigger, but the PEF cash window did respond and allocated USD 61m. The pandemic bonds themselves were triggered in April 2020 in the context of the Covid-19 pandemic. USD 196m were allocated to 64 low-income countries. The value of the pandemic bond fell accordingly on the secondary financial market, from -25% for Class A to -95% for Class B.
- The insurance window expired in July 2020 and has not been renewed at the time of writing. Criticism has focused on the triggers being too complex and the mechanism too slow to provide immediate payments where needed. The PEF was indeed designed after Ebola outbreaks in West Africa, and did not anticipate a pandemic of the nature and scale of Covid-19 (PEF-eligible countries represented less than 1% of global Covid-19 cases). This highlights the risk for innovative financial instruments to be designed after yesterday's crises, and to provide only partial support for tomorrow's emergencies.

<sup>32</sup> For more details, see for example L'Actuariel (quarterly publication of the French Actuarial Society), 'Les Pandemic bonds à l'épreuve du feu', June 2020.

### 3. HURDLES TO INVOLVING CAPITAL MARKETS IN PANDEMIC RISK

87. The current ILS market consists of a limited pool of fund managers. They often source their capital from pension funds, who allocate a small fraction of their alternative assets strategy to the ILS asset class. The total current size of the CAT ILS market is around USD 45bn of outstanding risk capital<sup>33</sup>, while the total ILS market is estimated at around USD 88bn<sup>34</sup>. Even if it were entirely mobilized towards pandemic relief efforts, these **amounts fall far short of the government relief packages** injected to shore up economies in response to the Covid-19 pandemic so far (the EU's response package alone stood at EUR 750bn when agreed in July 2020). Worse still, by several concurring industry estimations<sup>35</sup> investors could support only up to a couple of billions of additional capacity to back new pandemic CAT bonds, a volume that would be even less systemically relevant in the face of the massive economic losses linked to Covid-19 (for pure biometric risk not linked to economic losses, the risk appetite currently seems to remain high amongst ILS investors, albeit at increased prices). The challenge for transferring a systemic risk like pandemic-related NDBI is to develop structures that are more acceptable for the deeper traditional capital markets.

88. The typical selling point of classical ILS (e.g. CAT bonds) for external investors is that they are a diversifying, high-yield asset class. However, there is some positive correlation between pandemic and market risk, as a global pandemic such as Covid-19 is likely to spark a recessionary cycle. This correlation is partial and asymmetrical (a recession will not directly cause a pandemic). Some of the diversification benefits to investors would remain, but it is difficult to measure how material they would be. The proper tail-risk dependencies would need to be captured in capital models through more advanced metrics than simple linear

correlations (e.g. copulae<sup>36</sup>). In any case, the **correlation** with the rest of the economy has been identified by a large number of insurance market participants as the major hindrance for pandemic insurance coverage. In consequence, there is a need to broaden the number of investors who can support this risk beyond those dedicated ILS investors who are mainly looking for the diversification.

89. As a niche market, ILS can also suffer from liquidity issues and lose substantial value on the secondary market because of anticipated loss from events or if they have to be disposed of by investors under 'fire sale' market conditions. For example, more selling was observed during the first Covid-19 lockdown in March 2021, in order to create liquidity for funds to cover positions in other asset classes. This raises in turn the question of the **target investor base** i.e. which kind of investors would be eager to take on and retain this risk. It would need to be large and sophisticated investors with a limited exposure to the downsides of a pandemic. This category might potentially include investment funds associated with pharmaceutical companies, online retailers, and technology companies offering remote entertainment or workspace solutions, or supermarket chains. However, this list of candidate investors remains speculative at the time of writing, and may not prove relevant in the case of a future pandemic whose features would be different from Covid-19. Candidate investors would also need to demonstrate the technical capabilities and know-how to invest in such structures

90. The all-important issue of the **triggers for pay out** (see: box on parametric insurance above) applies also to ILS: triggers linked to the declaration of a pandemic emergency or lockdown by governments may be viewed with suspicion by investors, and diminish their appetite to provide funding because of the high moral hazard and because of the inherent legal uncertainties.

91. On a more fundamental level, most capital market investors lack the **risk modelling and actuarial skills** necessary to assess and manage pandemic risk. Even

33 <https://www.artemis.bm/dashboard/catastrophe-bonds-ils-issued-and-outstanding-by-year/>

34 Source: Marsh&MacLennan

35 See for example Hannover Re CEO interview with the NZZ, July 2020 - <https://www.artemis.bm/news/capital-markets-could-fund-2bn-of-pandemic-bonds-hannover-re-ceo-henchoz/>

36 See for example Casualty Actuarial Society, 'Tail Risk, Systemic Risk and Copulas', Andy Staudt, Fall 2010-Volume 2 - <https://www.casact.org/pubs/forum/1offorumpt2/Staudt.pdf>

within ILS investors, these skills are usually more focused on traditional non-life perils such as hurricanes or earthquakes, which have fundamentally different characteristics than pandemics. At the moment, most capital market investors lack credible modelling to rely on for pricing current and future pandemic risks. For example, currently available models for the spread of Covid-19 rarely make predictions beyond a time horizon of a few weeks, notably due to uncertainties around government responses (and when they do, they do so by exploring hypothetical what-if scenarios)<sup>37</sup>. Together with the lack of a clear target investor base, this uncertainty makes such complex investments only suitable to a small minority of sophisticated investors, lest pandemic risk be misallocated across society as a whole. Therefore, educating target investors about the risk and return profile of pandemic-related instruments is a prerequisite to raising interest from ILS capacity providers and from a broader investor base beyond the niche ILS market. This will notably require larger amounts of reliable data to become available, as well as the integration of epidemiological and economic models. When this happens and pandemic risk is better understood and managed, then the risk can be more accurately modelled and commoditised.

92. In conclusion, the lack of diversification and consistent data from objective sources, as well as the diffi-

culty to price the risk, remain the main obstacles to involving capital markets, along with the complexity of defining appropriate triggers. In addition, any solution modelled on the current pandemic could prove inadequate for the next one, as the experience of the World Bank’s PEF has shown. For now, simpler refinancing instruments with no shared insurance mechanisms (such as the EU’s recent social bond issuance) may be the immediate way forward.

93. Over the medium-term, progress in pandemic risk modelling and the potential emergence of more consensus around **key risk indicators and adequate prevention measures** could increase investors’ appetite for ART solutions. Over time and as pandemic risk will be better understood and priced, a new market for this risk might begin to emerge (similarly to the gradual progress made on terror risk after the 2001 World Trade Center attacks).

94. The rise of investing according to environment, social and governance (ESG) criteria and incentives (such as the supported by the development of EU Taxonomy for example) could also encourage the allocation of capital to financial instruments designed to cover pandemic risk, and to support the insurance industry in fulfilling its role as society’s risk manager. Resilience bonds with embedded earmarking of prevention measures, issued by a well-rated counterparty, could be welcomed by investors increasingly looking through a sustainability lens.

37 See for example Oliver Wyman’s Pandemic Navigator <https://pandemicnavigator.oliverwyman.com/>

Table: How capital market solutions can contribute to achieving shared resilience solutions today.

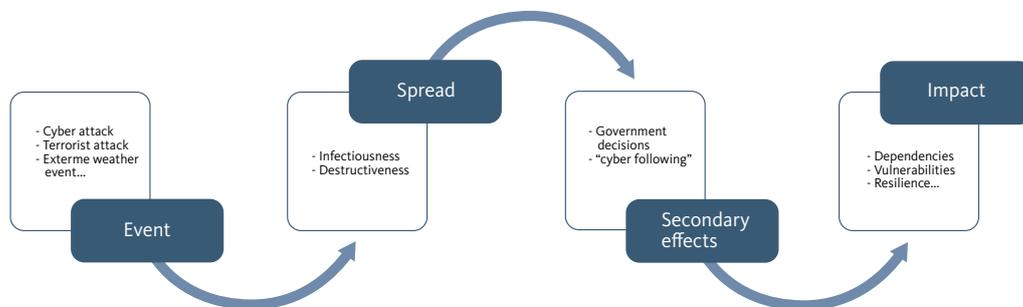
Principle / Solution	Classical ILS	PEF (or similar pandemic bond)	PPP leveraged pandemic fund	Sovereign social bond
Sharing of costs and responsibilities between private and public sector	No (private)	Yes	Yes	No (except sovereign credit risk)
Central coordination across public and private entities			Potentially	No (public)
Conditional upon prevention and adaptation measures	Potentially	No (but could be potentially included)		Yes
Insuring against a portion of the economic costs	Yes (but insufficient capacity)	Yes (but PEF was not adequate for Covid-19)	Subject to finding right investor base	Yes (but not an insurance mechanism)
Is such a solution currently offered?	Not on the necessary scale	No (PEF was not renewed)	No (no precedent yet)	Yes

# ADDRESSING SYSTEMIC RISK THROUGH MULTI-PERIL POOLING

- 95. Having regard to the systemic impact of the COVID-19 pandemic, a broader approach to seek coverage for systemic risks, triggered by different types of perils should be investigated.
- 96. While today's solutions are focusing on the loss of non-damage business interruption as a result mainly of government containment measures, as the pandemic unfolds, other financial risks develop as a result of increasing insolvencies or vulnerabilities, making society prone to suffer from 'following' events.
- 97. Proliferating global networks, both physical and virtual, inevitably incorporate more fat-tail risks into a more interdependent and "fragile" system. Risks such as pathogens but also computer viruses, hacking of information networks, acts of terror or natural catastrophes... can create a rolling collapse—a true black swan<sup>38</sup>.

## 1. SYSTEMIC RISK

- 98. Systemic risk is defined by the potential of an event or shock to cause broad-based disruption resulting in a loss of trust and capital. This breakdown will then cascade to other sectors of the economy, causing significant adverse effects to public health or safety, the economy or national security.
- 99. Systemic risks have been studied and addressed in many fields (cyber, financial sector<sup>39</sup>, terrorism, infectious diseases, global supply chain, climate<sup>40</sup> ...). Not all events will trigger a systemic risk. This will depend on a number of attributes of the event itself (infectiousness, destructiveness...), of secondary effects<sup>41</sup> from the initial event (incl. response and recovery) and of the impacted system (common vulnerabilities, concentrated dependencies, resilience...) as identified in Annex I for different perils.



- 100. An example of another event causing systemic risk are the 2011 floods in Thailand. Traditionally, natural catastrophe losses are regional in nature, even if the losses involved are immense and many people can lose their lives. However, this catastrophe resulted in a global shortage of computer parts for hard drives, as many of the key suppliers were located in the flooded areas north of Bangkok<sup>42</sup>.
- 101. This shows that also natural catastrophes can be systemic and global in nature as they hit increasingly vulnerable societies and the global economy becomes ever-more interconnected and reliant on supply chains.

38 <https://www.newyorker.com/news/daily-comment/the-pandemic-isnt-a-black-swan-but-a-portent-of-a-more-fragile-global-system>

39 EIOPA (2019), [https://www.eiopa.europa.eu/sites/default/files/publications/pdfs/2019-03-29\\_discussionpapersystemicriskmarcoprudentialpolicyinsurance.pdf](https://www.eiopa.europa.eu/sites/default/files/publications/pdfs/2019-03-29_discussionpapersystemicriskmarcoprudentialpolicyinsurance.pdf)

40 David King, et al. (2015). "Climate Change: A Risk Assessment." University of Cambridge. <http://www.csap.cam.ac.uk/projects/climate-change-risk-assessment/>

41 Primary effects are those that occur immediately from the events. Secondary effects are the subsequent effects of the event, and can be even more devastating than the primary ones. For example, lockdowns can result in significant BI damages. In addition, secondary effects can also come from a secondary peril which is "following" the initial peril. A parallel could be made with fire following - after a large earthquake, there is likely to be damage to buildings and infrastructure, which means that there is more opportunity for a fire to start and spread. A fire which starts following an earthquake can develop into a serious emergency. Similar thinking could be applied to an initial pandemic event where cyber risks could be increased as people are working from home.

42 <https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/climate-change/weather-risks-jeworek.html>

## 2. BENEFITS AND CHALLENGES OF A MULTI-PERIL APPROACH

102. In pursuing a multi-peril approach, the following benefits are generally expected: **diversification between risks, increased capacity and reduced opportunity costs.**

### Diversification

103. In order to benefit from diversification effects, (re)insurers combine multiple perils in their portfolios. If two perils are not 100% correlated then the aggregated risk is lower than considering each risk separately<sup>43</sup>. For example, the extraordinary risk insurance scheme of the Consorcio de Compensación de Seguros (CCS) uses a multi-peril approach (flood, coastal flood, strong wind and tornado). One benefit of this approach for the CCS is that it allows to have affordable flat rates (the rates benefit from risk diversification)<sup>44</sup>.

104. However, there is an issue where multiple-perils are correlated. Two perils could be uncorrelated most of the time except during large, systemic events. The difficulty in properly assessing and modelling tail-dependencies is one of the obstacles to having a risk-based view of a multi-peril solution. The global pandemic has for example seen a huge rise in people working from home, shopping online, and generally being more digitally connected. At the same time, events like COVID-19 are often attractive opportunities for cybercriminals<sup>45</sup>. 40% of the respondent from the COVID-19 survey conducted by FERMA observed that cyber risks represent a key emerging risk as a result of the current COVID-19 crisis – a ‘following’ event<sup>46</sup>. The potential resulting damages of a cyber-attack during a pandem-

ic event could be significantly increased compared to “normal” times.

### Capacity

105. Multi-perils pooling could increase the amount of capacity available to cover systemic risks. However, there is also a significant accumulation risk. Not only can some perils increase the probability of another to happen (for example, cyber as a ‘following’ event after a pandemic). Increasing capacity in this way would also mean higher capital requirements.

106. Experience in the ILS market shows that whilst there is support of multi-peril transactions (which makes up the majority of the cat bond market), in general there is a preference for single peril transactions as some investors may prefer one peril type over another (e.g. different risk tolerance, portfolio composition etc.). Multi-peril pooling could potentially decrease the amount of capacity available as each capacity provider would need to have a risk appetite for all covered perils or reinsurance limits could be exhausted after the occurrence of one peril.

### Opportunity cost

107. Developing a solution only for pandemic events could be seen as short-sighted. A multi-peril approach to systemic risks would likely be more attractive to a broader customer base than a pandemic insurance product. Other perils could trigger a systemic risk and the society would face similar challenges issues as for the current pandemic, including socio-economic vulnerabilities, acceptance of response measures, and behavioural dynamics when it comes to investing in prevention. A multi-peril scheme may be better accepted, as the money will not be used only for a single type of peril, which might have a very low probability of occurrence, but already in a forward-looking manner aim at increasing society’s resilience to systemic challenges. Having a single entity dealing with multiple-perils could also be economically more viable and adjustments could be made over its lifetime, rather than having to create new schemes altogether when risk has already materialised (post factum). On the other hand, considering a multi-peril approach also increases the complexity, challenges the possibility to have a risk-based approach and decreases the transparency of a potential scheme. Without a risk-based approach, sustainable insurance solutions which would also reflect prevention measures are more difficult to price.

108. Over time, investigating multi-peril solutions is likely to stimulate further competition in the private mar-

43 Using a basic example, let’s assume a windstorm risk = 1 and a flood risk = 2. Windstorm and Flood risk are assumed to have a correlation of 0.5. Now when considering the two risk together, you get a lower risk (Total risk =  $\sqrt{1+4+0.5*4}$ ) = 2.6) as if you would consider the two risks separately.

44 Insuring climate-related natural catastrophes in Spain: The Consorcio de Compensación de Seguros and the Extraordinary Risks Insurance Scheme - Expert Workshop CCA-DRR.

45 Cyber-attacks during the pandemic times - Vitaly Kamluk, Kaspersky APAC <https://www.brighttalk.com/webcast/15591/395083/cyber-attacks-during-the-pandemic-times>

46 COVID-19: FERMA survey shows risk managers’ contributions to response and resilience - Federation of European Risk Management Associations – FERMA

ket and increase the supply of **new forms of cover**. Some initiatives are underway to enlarge existing government-backed insurance schemes to cover health pandemics. One of the ideas under consideration is for example an expansion of Pool Re<sup>47</sup>, whereby a holding company would collect Pool Re's reserves for various claims, including terror attacks, pandemics, cyber-attacks or large natural catastrophes.

109. However, not all Member States have pools in place today. In addition, the existing pools handle direct damage and have been developed by specialists designing long-term underwriting policies, and are not tailored to pandemic risk, given that the objective of the coverage in this instance is to be rapidly distributed to meet immediate business and consumer needs.

110. Therefore, in pursuing multi-peril solutions, the following key objectives need to be kept in mind in order to achieve an effective pooling of multiple risks, based on common characteristics of different perils. This is where an important value lies in redefining existing multi-peril solutions or establishing multi-peril schemes as a lesson learnt from the current pandemic:

› **Identify common attributes that can cause systemic risks:** better understanding the different attributes (see: Table below), which cause systemic risks, can help to understand the risk, or define relevant common triggers for parametric solutions related to systemic risks.

› **Identify potential common prevention measures:** Learnings from different prevention measures (to address socio-economic vulnerability, interconnectedness, homogeneity) for different perils might help in designing relevant prevention measures for systemic risk.

› **Identify secondary effects and following events that are likely to occur in a systemic event:** the impact of the prevention measures (such as the impact of lock-down measures on business interruption) as well as the risk 'following' (e.g. cyber-attacks following pandemics) may be similar for some perils.

111. In the context of systemic risk, it is not clear how much diversification benefit would arise using a multi-peril approach due to potential tail-dependencies and special care would need to be taken to monitor accumulation risks. It may also not be a short-term solution, especially where such schemes would need to be built up from scratch.

112. But having regard to the interconnectedness of the risks, the risk of 'following' events and the type of common prevention measures that can be taken to address socio-economic vulnerabilities and behavioural biases, as well as the opportunity cost of having separate solutions with limited capacity instead of one global scheme for covering various perils, the idea is worth pursuing.

113. In building new schemes, pandemic risks may therefore need to be addressed in the first instance, while other systemic risks will be incorporated in the future once sustainable solutions for pandemics risk have been put in place.

<sup>47</sup> PoolRe is the UK government-backed scheme created in 1993 to cover the costs of large terror attacks in response to IRA bombings <https://www.ft.com/content/ba7246aa-61db-44d7-b729-7a43271a7010>.

Table: Attributes of the system, the secondary effects and the event, which can trigger a systemic shock for different perils.

Trigger	Cyber attack	Pandemic event	Terrorist attack <sup>48</sup>	Climate change event	Financial crisis
<b>Event attributes</b>					
<b>Spread</b>	Move to one IT system to the other.	Move to one person to the other.	Move to one person (fear, virus...) to the other.	Move from physical risk to transition and liability risk	Move to one financial institution to the other (financial contagion).
<b>Destructiveness</b>	Failure of IT systems, inoperable systems. Non-physical damages, inoperable systems. Non-physical damages.	Number of death, BI... Mortality and non-physical damages	Number of death, buildings destroyed, BI... Mortality and (physical and non-physical) damages	Number of death, buildings destroyed, BI... Mortality and (physical and non-physical) damages Financial losses	Financial losses. Non-physical damages.
<b>Sophistication</b>	Attack's ability to exploit vulnerabilities and shift targets as event unfold.	Virus ability to exploit vulnerabilities and shift targets as event unfold.	Attack's ability to exploit vulnerabilities and shift targets as event unfold.		
<b>Secondary effects</b>					
	Responses and recovery	Governmental lock-downs Cyber following	Governmental lock-downs	Governmental lock-downs / request to leave region...	
<b>System attributes</b>					
<b>Criticality</b>	Importance of affected technical and business systems.		Importance of affected systems.	Whole regions can become 'stranded assets'.	Importance of the affected financial institutions.
<b>Interconnectedness</b>	Extend to which systems and organizations are connected to one another and to the larger economy.	Extend to which systems and organizations are connected to one another and to the larger economy.	Extend to which systems and organizations are connected to one another and to the larger economy.	Extend to which systems and organizations are connected to one another and to the larger economy.	Interconnectedness among the large banks for example.
<b>Resilience</b>	Deploy redundant systems for backup and recovery systems, alternative providers, defend against attacks.	Prevention measures encouraged by governments.	Prevention measures encouraged by governments at airports, concert halls...	Prevention measures on buildings for example encouraged by governments and facilitated by impact underwriting.	Prevention measures from regulators.
<b>Homogeneity</b>	Use of similar components or elements (software, hardware or services) across the ecosystem.		Use similar 'securities' concept at airport for example.		
<b>Vulnerability</b>	Age of IT systems	Age of population, health of population, health system, regulation in place...	Age of population, health of population, building standards, education...	Building standards, regulation in place...	Non-regulated market, not well capitalized firms...

48 A terrorist attack could also result in a cyber-attack for example. An important point to note about acts of terrorism is that they are not random. Unlike other risks such as pandemic or natural catastrophes risks, terror attacks are typically intentional, targeted attacks in specific locations designed to maximize damage.

## CONCLUSIONS

114. Relevant measures can be taken to improve insurability of non-damage business interruption risk in light of pandemics.
115. By promoting prevention measures, insurers can improve the capacity to reduce losses. This includes improving clarity on the scope of coverage as well as risk-based pricing of the cover and potential risk-reducing prevention measures, showing the true cost of the risk. This can be supported potentially by regulatory incentives, as well as by public-private initiatives for sharing data and aligning incentives for prevention measures. As part of such public-private initiatives, measures can be taken to align public-private incentives for risk prevention, reducing moral hazard and improving on the insurability of the risk.
116. Capital markets constitute a layer of potential alternative risk transfer. The challenges around designing new and successful capital markets instruments for financing business interruption risk in a pandemic crisis range from generating enough return and diversification for investors, to designing parametric triggers that are both objective (to counter moral hazard) and relevant (to limit basis risk). Progress on pandemic risk modelling and pricing will be needed. Public-private solutions for a leveraged pandemic fund may be a relevant option to consider in order to involve investors in a shared resilience solution.
117. While the diversification benefit from pooling is not clear, multi-peril solutions can provide opportunities for addressing the risk of 'following' events, developing common prevention measures, as well as addressing the opportunity cost of separate peril solutions (i.e. the fact that a single-peril pool is designed for the last crisis and will not address the next). In the short term, the focus can be on pandemic schemes, but the option to introduce future-focused multi-peril pools should be considered going forward.
118. Common challenges exist to risk prevention, risk transfer and risk pooling. Investments should be made in improving the modelling of pandemic risk to include the socio-economic vulnerability and behavior of individuals, businesses and public authorities in response to the risks. Additionally, the definition of objective and relevant parameters to trigger the payout of cover for losses requires further analysis.
119. Finally, proposals for pandemic schemes across jurisdictions (See Annex I) show commonalities but also differences, possibly warranting a European coordinated approach.

## ANNEX I - MAPPING OF SELECTED PROPOSALS FOR INSURANCE SCHEMES IN LIGHT OF COVID-19

Scheme	Name, origin, background.
<b>Nature</b>	Private, public or public-private; mandatory, voluntary or opt-out; expansion of existing system or creation of new scheme; distribution model.
<b>Target</b>	Does the solution target specific sectors (e.g. hospitality, retail business, manufacturing...) or sizes of market participants (self-employed, SME, large companies)?
<b>Cover</b>	Type of peril, multi- or single peril; type of cover (line of business, bundled or stand-alone); scope of cover (fixed of variable costs, (in)direct costs, secondary costs); payment trigger (type of metric use, correlation with amount of losses, geographic or sectoral scope, predictability);
<b>Claims</b>	Full-indemnity based or lump sum. Metrics that define the payout (e.g. % of certain pre-agreed metric, maximum period of pay out). Exclusions and limits (incl. waiting periods and deductible for public support)
<b>Pricing</b>	Pricing parameters, evolution of premium, payment modalities
<b>Risk transfer</b>	Involvement of private (re)insurance market, capital market and national government. Whether EU intervention is considered. <sup>49</sup>

49 The mapping lists selected proposals made in the past months by stakeholders, while discussions at national level are taking place. The mapping does not reflect final decisions made at national level. The mapping is based on exchanges with industry participants, with relevant input provided by Marsh&McLennan, based on publically available sources: <https://www.zurichna.com/knowledge/articles/2020/12/zurich-convenes-insurance-industry-to-address-pandemic-risk>, BCC: <https://www.businesscontinuitycoalition.com/>, PRIA: <https://maloney.house.gov/media-center/press-releases/rep-maloney-joins-with-industry-and-trade-association-leaders-to#:~:text=7011%2C%20the%20Pandemic%20Risk%20Insurance,pandemics%20or%20public%20health%20emergencies>; Chubb. Pandemic Business Interruption Program. <https://www.chubb.com/us-en/about-chubb/pandemic-business-interruption-program.aspx>; Consorcio de Compensación de Seguros. Natural catastrophes insurance cover. A diversity of systems. 2008. Website: <https://www.consorseguros.es/web/inicio>; FFA. Proposal for CATEX. <https://www.ffa-assurance.fr/actualites/la-ffa-precise-son-projet-catex>; GDV. Green pandemic protection - German Insurance Industry Association Green Paper. See <https://www.en.gdv.de/en/issues/our-news/insurance-industry-advocates-a-private-public-sector-protective-shield-59852>; Lloyd's. Supporting global recovery and resilience for customers and economies. The insurance industry response to COVID-19. See also: Lloyd's. Open source frameworks for systemic risk. <https://www.lloyds.com/news-and-risk-insight/coronavirus-updates-hub/supporting-global-recovery-and-resilience-for-customers-and-economies>; OECD. Responding to the COVID-19 and pandemic protection gap in insurance. Sept. 2020. <https://www.oecd.org/coronavirus/policy-responses/responding-to-the-covid-19-and-pandemic-protection-gap-in-insurance-35e74736/>; Report of working group on formation of an Indian Pandemic Risk Pool, 16 Sept. 2020, [https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral\\_Layout.aspx?page=PageNo4242&flag=1](https://www.irdai.gov.in/ADMINCMS/cms/frmGeneral_Layout.aspx?page=PageNo4242&flag=1)

## 1. Nature and target of the solutions

<b>Scheme</b>	<b>Nature</b>	<b>Target</b>
<b>CATEX</b>	FR. Proposal from FR insurance industry, November 2020. Public-private. Mandatory. New scheme, complementary to 'cat nat' and 'GAREAT' schemes, which cover physical damage. Distribution by insurance sector.	All companies covered by a retail or corporate comprehensive insurance policy, whatever their size and sector of business.
<b>GDV proposal</b>	Germany. Public-private. New scheme. Distribution by insurance sector.	Not restricted – potential to focus on SME with voluntary participation from large undertakings.
<b>Pandemic Risk Insurance Act (PRIA)</b>	US. Proposal for act introduced in US Congress in May 2020. Public-private (mostly public). Modelled on existing terrorism mechanisms (TRIA). Mandatory offer, voluntary take-up from businesses (no mandatory purchase).	Not restricted - businesses and organizations (incl. non-profits) of all sizes.
<b>Business Continuity Protection Program (BCPP)</b>	US. Alternative proposal from the US insurance industry, May 2020. Public federal business revenue reimbursement program. Similar to the Federal Flood Insurance Program. Mandatory offer, voluntary take-up. Insurers provide administration services.	Not restricted - businesses and organizations (incl. non-profits) of all sizes. Supplementary voluntary program for larger business.
<b>Pandemic Business Interruption Program</b>	US. Alternative proposal by global (re)insurer Chubb, July 2020. Public-private (mostly public). Mandatory offer for every P&C insurer to small business clients (<500 employees). Voluntary take-up, with strong 'opt-out' requirements. Additional voluntary program offer for large businesses. New federally reinsured program for large businesses (Pandemic Re). Distribution by insurance sector.	Businesses and organisations of all sizes: SME and large company programme.
<b>ReStart</b>	Model proposed by Lloyd's – not all design options fixed. Private insurance pool. Optional for customers.	Small companies. Options: define by geography, industry or customer segment.
<b>Recover Re</b>	Model proposed by Lloyd's - not all design options fixed. Public-private. Insurance product: multi-year contract. Distribution by insurance sector.	Not restricted.
<b>Black Swan Re</b>	Model proposed by Lloyd's - not all design options fixed. Public-private. Government-backed industry reinsurance pool. Potentially mandatory.	Not restricted.
<b>Indian Pandemic Risk Pool</b>	Proposal from working group composed of industry representatives under the heading of the Indian Regulatory and Development Authority of India, Sept. 2020. Pool with government backstop, administrated by GIC Re (manager of Indian Terrorism and Nuclear Pools). Mandatory for sectors covered in the pool.	Initial focus on micor, small and medium-sized enterpises (MSME) and migrant workers

## 2. Cover and claims handling

Scheme	Cover	Claims handling
<b>CATEX</b>	<p><u>Single peril:</u> future pandemics or epidemics (i.e. excl. COVID-19)</p> <p><u>Cover:</u> Not defined as business interruption cover – lump sum aims at getting through the crisis by reducing the risk of default (not indemnity insurance). Bundled: Extension to ‘fire’ cover.</p> <p><u>Scope:</u> Fixed costs: 50% of the gross margin lost excl. payroll and profits (‘resilience lump sum’). Direct and indirect losses.</p> <p><u>Trigger:</u> state of pandemic declared on all or part of the French territory, either by the WHO or by an independent reference body, and which would lead the public authorities to declare a total or partial closure of a group of companies for a specific period of time in order to fight against the spread of the pandemic or epidemic.</p>	<p>Pay out within 20-30 days.</p> <p>Percentage of lost revenues would depend on the sector of business and defined according to a grid common for all insurers.</p> <p>Eligibility criteria: companies for which revenues have fallen by more than 50% during the lockdown and by more than 8% calculated over the corresponding year.</p> <p>Cover maximum 3 months of total or partial closure, can be split over 12 months.</p> <p>Limit per company and per pandemic: €500K (=maximum compensation for large companies).</p> <p>Waiting period min. of 15 days of closure (consecutive or in total).</p>
<b>GDV</b>	<p><u>Single peril:</u> pandemics.</p> <p><u>Cover:</u> NDBI.</p> <p><u>Scope:</u> Direct and indirect losses.</p> <p><u>Trigger:</u> WHO/national or regional authority decision and/or government measures taken in response to pandemic.</p>	<p>Lump sum - to be considered if complemented with risk-based elements (e.g. sectoral risk exposure).</p>
<b>Pandemic Risk Insurance Act (PRIA)</b>	<p><u>Single peril:</u> future pandemics or infectious disease (from 2021).</p> <p><u>Cover:</u> NDBI and event cancellation. Bundled with private business interruption insurance: BI coverage to be offered on the same terms and conditions as underlying coverage in covered lines.</p> <p><u>Scope:</u> All losses during the period when covered public health emergency is in place.</p> <p><u>Trigger:</u> Specific outbreak of infectious disease or pandemic for which a public health emergency is declared by Health Secretary.</p>	<p>Insurer submits claims to Treasury with written certifications of payments already made for insured losses. Treasury to issue additional rules and procedures for claims and payments.</p>
<b>Business Continuity Protection Program (BCPP)</b>	<p><u>Single peril:</u> future pandemics.</p> <p><u>Cover:</u> NDBI.</p> <p><u>Scope:</u> 80% of eligible operating expenses, up to three months.</p> <p><u>Trigger:</u> Health emergency declaration: state governor requests presidential declaration of “viral emergency” due to state-mandated closure to specified type of business.</p>	<p>Policy terms: Purchase of cover must occur 90 days prior to any formal declaration of viral emergency.</p> <p>Monthly payments on days 1, 30, 60.</p> <p>Businesses certify they will only use funds for allowed purposes (e.g. retaining employees and paying necessary operating expenses), no claims adjudication necessary but program may audit post payments.</p>
<b>Pandemic Business Interruption Program (‘Pandemic Re’)</b>	<p><u>Single peril:</u> future pandemics (excluding Covid-19). NDBI.</p> <p><u>Cover:</u> Business interruption. For small businesses: Added to existing business owners or workers compensation insurance policy. Policy terms: standard terms and conditions of the underlying policy (unless modified). For small businesses: policyholders must continue payroll – no layoffs.</p> <p><u>Scope:</u> for small businesses: fixed – multiple of payroll expenses. Large businesses: expenses, not covering lost profit.</p> <p><u>Trigger:</u> CDC declaration of pandemic. Public health declaration by Health secretary or emergency declaration by President. State orders are in force that close and/or curtail normal business activity.</p>	<p>Exclusions: For small businesses: up to 3 months of payroll and operating costs, based on a multiple of monthly payroll expenses. 14-day waiting period. No claim adjudication necessary.</p> <p>Large businesses: Up to 3 months of expenses, with USD 50m maximum per policyholder. 30-day waiting period. Company suffering covered loss files claim with insurer, who processes and submits to Pandemic Re following adjustment process.</p>

<b>Scheme</b>	<b>Cover</b>	<b>Claims handling</b>
<b>ReStart (Lloyd's)</b>	<p><u>Single peril:</u> COVID-19, 'future waves'.  <u>Cover:</u> NDBI. (Potential to add employers liability or public indemnity cover)  <u>Trigger:</u> options no specified: Dual - evidence of specified event: international body (WHO) or government declaration and/or evidence of business disruption (e.g. metrics such as drop in economic activity, increase in absenteeism and /or a gvt/regional mandated lockdown)</p>	/
<b>Recover Re (Lloyd's)</b>	<p><u>Multiple perils:</u> pandemics (incl. future COVID-19 waves) and potentially other systemic events.  <u>Cover:</u> NDBI. Stand-alone multi-year policy.  <u>Trigger:</u> not specified. evidence of specified event: international body (WHO) or government declaration and/or evidence of business disruption (e.g. metrics such as drop in economic activity, increase in absenteeism or a gvt/regional mandated lockdown)</p>	Loss amount could be based on prior year's accounts, or possibility to make partial payments (e.g. 80% of Bi where the business can operate at 20%)
<b>Black Swan Re (Lloyd's)</b>	<p><u>Multiple perils:</u> systemic events.  <u>Cover:</u> NDBI.  <u>Scope:</u> Direct and indirect.  <u>Trigger:</u> not specified.</p>	/
<b>Indian Pandemic Risk Pool</b>	<p><u>Single peril:</u> future epidemic/pandemic (COVID-19 excluded)  <u>Cover:</u> in a first phased focused on NDBI, covering wages for MSME sector and migrant workers. Extend to other lines of business in a second phase (e.g. health or life insurance. Bundling with property-fire.  <u>Scope:</u> Salary protection up to 3 months or actual lockdown period whichever is lesser. Approx. 90 \$ per month for a max of 3 months and for max of 10 employees  <u>Trigger:</u> multiple triggeres, separate for epidemic and pandemic. (WHO declaration of pandemic + lock down by state or central gvt).</p>	Assumption: 40 mn employees, pay out of max 3 months. Total pay-out of 10bn \$ Claims payment on parametric basis. Trigger: after 15 days of lockdown following a pandemic. The payout for the first month would be paid for entire month even though it would trigger after the 15th day (paid as franchise for first month) and paid before 10th of subsequent month.

## 3. Pricing and risk transfer

Scheme	Pricing/premium payment	Risk transfer
<b>CATEX</b>	Criteria for premium calculation: declared revenue and sector of activity as per INSEE classification (National Institute of Statistics and Economic Studies). For companies with revenues of less the €100k, flat-rate premium, regardless of the business. For companies with revenues of over €20M, premium capped, per sector.	<u>Private insurers</u> : 2 billion euro from private insurers and reinsurers, per year, co-insurance (CATEX pool). <u>Government</u> : CATEX pool buys reinsurance cover from public reinsurer CCR. CCR: quota-share and stop-loss beyond 2 bn EUR reinsurance cover from CCR. <u>Risk mitigation</u> : not applicable.
<b>GDV</b>	Surcharge on specified existing policies - risk based or flat rate levy.	Fixed % by industry. Pooling mechanism. <u>Risk mitigation</u> : Business continuity management, certified measures to be in place.
<b>Pandemic Risk Insurance Act (PRIA)</b>	Rate determined by insurers subject to state regulatory rate and form approval as applicable.	<u>Private insurers</u> : deductible of 5% of annual premiums and cover the first layer of losses up to USD 250m. Private reinsurance: Participating insurers may purchase commercial reinsurance to protect their retentions <u>Government</u> : Federally funded pandemic reinsurance backstop. Gvt to cover 95% of losses beyond private insurers' initial USD250m loss threshold. Aggregate limit capped at USD750bn, beyond which the Treasury Secretary can determine the pro-rata share of compensation.
<b>Business Continuity Protection Program (BCPP)</b>	Rate determined by Treasury, uniform % of revenue to be replaced plus administrative costs. Program Director to develop minimums and payment plan options; aggregated data on prices and payments to be publicly available.	<u>Government</u> : Fully federally backed system: government pays all claims (no aggregate limit). Insurers bear no risk; limited to administering policies. Additional provision for a supplementary voluntary program for larger business, with a 90/10 split between government and insurers. In years without losses, funds can purchase Treasury securities; if exposure exceeds assets, the program may borrow from Treasury to pay recorded losses. Intention to cede risks to private reinsurers or capital markets (via ILS). <u>Risk mitigation</u> : Business attests to compliance with CDC, OSHA and pandemic, all applicable federal guidance on health and safety measures during the health emergency.
<b>Pandemic Business Interruption Program</b>	Small businesses: premium is only for the risk assumed by the insurer (no premium levied for government's share) Large businesses: Regular pricing process, premium covering both insurers' and government's share.	For small business: Co-insurance and government backstop (direct U.S. Treasury funding) for SME for a first layer of losses. Total program capped at USD 750bn. For large business: new state reinsurer entity 'Pandemic Re' for larger companies. total program capped at USD 400bn. Insurers' share starting at USD 15bn for each program for year 1, and intended to double over time. Intention to transfer risks to capital markets via ILS.
<b>ReStart (Lloyd's)</b>	Annual policy, premiums charged upfront.	No government intervention.
<b>Recover Re (Lloyd's)</b>	Mandatory premium payments over the full term or cancellation penalty to ensure insurers' upfront claims costs are recovered - insurers to recoup upfront claims costs over longer (10-20 years) term. Fixed or variable premium; level or increasing as business recovers; monthly or annually. Other: portability - long term contract. Valuation - expected future premiums. Annual policy, premiums charged upfront.	<u>Government</u> : Guarantee against default on future premium payments and/ or gvt provision of initial cash-flow if early event or event of significant scale. Option for credit risk mutualisation to minimise gvt liability.
<b>Black Swan Re (Lloyd's)</b>	Premium payments by Black Swan Re for gvt guarantee.	Government backstop to reinsurance pool for excess claims.
<b>Indian Pandemic Risk Pool</b>	Mandatory for sectors covered in the pool. Targeted premium level for MSME (starting at appr. 14 \$, gradually increasing to approx. 21 \$ per employee). Subsidisation by gvt in initial phase, or Asia Development Bank, World Bank, ...	<u>Private insurers</u> : initial capacity of the pool: 700mn \$. Investment of premiums in govt securities or specifically designed bonds <u>Government</u> : backstop of 10bn \$ up to 17bn in subsequent phase (when other lines of business are being added). Gvt backstop to gradually decrease). Issuance of pandemic bonds. Expected pool to be self-sufficient in 20-25 years.

## Existing schemes: Consorcio, Pool Re and Flood Re

<b>Scheme</b>	<b>Nature and target</b>	
<b>Consorcio</b>	ES. Since 1990. Public-private. 'Public business entity', with own legal personality and own budget, subject to private law. Governed by representatives from private insurance companies and DGSFP (insurance regulator). Mandatory. Target not limited.	
<b>Pool Re</b>	UK. Since 1993. Permanent scheme, public-private. Mutualisation (pooling) of insurance resources. Voluntary participation by insurers. Target not limited.	
<b>Flood Re</b>	UK. Since 2014 (operational since 2016). Temporary solution (aim for private market to be self-sufficient by 2039). Mutualisation (pooling) of insurance resources. Not-for-profit reinsurance company. Governed by insurance industry. Voluntary participation by insurers but mandatory levy on insurers providing home cover (pro rate to their market share, up to total of £180m). Target = homeowners.	
<b>Scheme</b>	<b>Cover</b>	<b>Claims handling</b>
<b>Consorcio</b>	<p><b>Multiple perils:</b> 'Extraordinary risk': natural hazards (extraordinary floods, earthquakes, tidal waves, volcanic eruptions, atypical cyclones and the falling of astral bodies and meteorites) and those of a political/social nature (terrorism, riot, civil commotion etc.). Also: export credit insurance, compulsory motor insurance, agricultural (crop) insurance and liquidation of insurance companies. Excluded: national disaster or calamity, nuclear risks.</p> <p><b>Scope:</b> Variable costs: Cost of repair or replacement of damaged property, in relation to sum insured. Direct damage, incl. and business interruption related to property damage. Not: NDBI, not: indirect damage (e.g. supply chain disruption losses). Geographical scope: people or property located (resident) in Spain</p> <p><b>Cover:</b> bundled: Inclusion of cover for extraordinary risks in personal accident, life insurance and some branches of property damage, including business interruption. Consorcio insures on a subsidiary basis – i.e. claims not covered by the insurer.</p> <p><b>Trigger:</b> automatic cover for nat cat (no official declaration of disaster required from public authorities).</p>	Minimum deductibles to ensure compulsory protection (e.g. no deductibles in life and accident, 7% for property damage, for BI as established in the policy). Claims management by insurer or directly by Consorcio. Claims to be submitted within 7 days following occurrence of the loss. Loss adjustment by Consorcio.
<b>Pool Re</b>	<p><b>Single peril:</b> acts of terrorism.</p> <p><b>Cover:</b> Commercial property damage, and since 2018: NDBI. Bundled with commercial property insurance with possibility for opt-out; or opt-in (i.e. no stand-alone cover)</p> <p><b>Trigger:</b> acts of terrorism define in Reinsurance Act + certification by UK Treasury as act of terrorism.</p>	Insurer-specific threshold ('member retention' determined by the insurer's share of the market-wide terrorism portfolio, capped at £250m for a single event, and £410 m as annual limit)
<b>Flood Re</b>	<b>Single peril:</b> - flood risk	Deductible (excess) of £250. Claim to be made to the insurer, Flood Re only pays when the insurer has finalised the claim.
<b>Scheme</b>	<b>Pricing</b>	<b>Risk transfer</b>
<b>Consorcio</b>	Mandatory surcharge on accident, life and property LoB. Rates approved by DGSFP, set out in law. Premiums and surcharges collected by insurers. Endowment of common fund available to insured affected by all hazards covered by Consorcio.	Private insures and national government (public backstop not defined). No requirements for risk mitigation measures.

Scheme	Nature and target	
Pool Re	Premium rates determined by Pool Re.	<p><u>Private</u>: Participating insurers cede full terrorism risk to Pool Re, along with premium collected. Pool Re purchases cover from private reinsurers (£2.4bn)</p> <p><u>Capital markets</u>: Pool Re purchases cover from capital markets (ILS)</p> <p><u>Public</u>: UK treasury back-stop through unlimited loan arrangement, when reserve and reinsurance capacity exhausted. ~50% of ceded premiums are transferred to UK treasury. Repayment by Pool Re of government loan over time by collecting 10% extra premium (no impact on government budget permitted)</p> <p><u>Risk mitigation</u>: no direct requirement for policyholders to have resilience measures in place, but if they have exercised risk management they are eligible for premium discounts of up to 7.5% (via vulnerability self-assessment tool)</p> <p><u>Other</u>: annual dividend to members.</p>
Flood Re		<p>Private insurers: cede risks to Flood Re. Funding: £180m levy paid by insurers offering home cover – regardless of participating on the scheme. In addition: fixed premiums paid by ceding insurers, based on council tax band of insured properties – capped. Possibility for Flood Re to impose additional levy in extreme circumstances, for liquidity purposes.</p> <p>Private reinsurance: ~£2.2bn risk transfer to private reinsurance market. For losses beyond £2.5bn, the loss returns to the insurers, pro-rata.</p> <p>Government: no government backstop.</p> <p><u>Risk mitigation</u>: investment in flood risk management and data. Government investment in flood mitigation measures on ongoing basis, Flood Re looking into flood resilience measures. Houses built since 2009 are not covered by the scheme.</p>

## ANNEX II - ELEMENTS ON OF FURTHER PROTECTION GAPS ARISING FROM COVID-19

120. The insurance protection gap may also increase in other lines of business, beyond NDBI, as a consequence of the pandemic crisis. Some proposals for solutions therefore also include multi-lines coverage for BI and event cancellation. (e.g. in the US Pandemic Risk Insurance Act, see Annex I). Therefore, other means for increasing capacity and diversifying risks, across lines of business, sectors or regions affected should be investigated as opportunities for diversifying risk and increasing capacity for covering systemic risk.

121. It may also be worth investigating the bundling of business interruption and life covers, if a negative correlation between NDBI losses and mortality or health losses would be evidenced, and potentially benefiting from modelling approaches in life/health, where governmental lock-down scenarios are being used.

### Protection gap status following the COVID-19 event in the EU

<b>NDBI</b>	<b>Very high</b>
<b>Event cancellation</b>	<b>Will likely increase</b>
<b>Travel</b>	<b>Will likely increase</b>
<b>Health</b>	<b>Might increase</b>
<b>Credit</b>	<b>Might increase</b>
<b>Liability</b>	<b>Might increase</b>
<b>Life</b>	<b>Might increase</b>

### Event cancellation

Event cancellation insurance generally provides coverage only when there has been a triggering event under the policy. Some policies are written, for example, to only cover cancellations caused by rain or bad weather. Other event cancellation policies are all-risk policies, meaning that coverage may be triggered by any cause that is not specifically excluded. For all types of event cancellation insurance, the triggering event must have been fortuitous, or outside of the policyholder's control. However many event cancellation policies normally exclude communicable disease, specific names viruses, such as SARS or MERS or other exclusion which may be applicable to COVID-19.

For example, Hiscox event cancellation policies do not provide cover for any losses arising from any communicable disease, which leads to quarantines being imposed, restrictions in the movement of people or animals or travel advisory or warnings being issued by any national or international body or agency.<sup>50</sup> It can be expected that in light of COVID-19, companies are carefully checking the wording of the insurance contract.

<sup>50</sup> [Events Cancellation Insurance Coronavirus FAQs | Hiscox UK](#)

### Travel insurance

Individuals and businesses that had planned and paid for travel may have cancelled that travel either voluntarily out of concern about the spread of coronavirus or due to travel advisories or restrictions imposed by governments or suspension of flights by airlines. Some individuals that travelled to destinations that became subject to quarantine requirements also have faced additional expenses related to their quarantine in a foreign country or extra costs. Insurance coverage for trip cancellation will usually only reimburse expenses after all attempts for refunds have been exhausted and only when there are no official advisories against travel to that destination and/or no known circumstances at the time of booking.

In 2019, EIOPA had already highlighted issues around travel insurance coverage, denied claims, unclear and conflicting terms and condition.<sup>51</sup> Some insurance associations and/or regulators have provided statements or advice on the availability of insurance coverage for trip cancellations related to the COVID-19 pandemic. In the United Kingdom, members of the Association of British Insurers have pledged to provide information on how to recover costs due to travel cancellations, provide a clear information on coverage terms at point of sale and to fairly consider all valid insurance claims for costs that cannot be otherwise reimbursed.<sup>52</sup>

### Credit insurance

Credit insurance is of significant economic importance. Its total exposure amounts to around USD 3.3 trillion. Approximately 15% of global merchandise trade is covered by credit insurance. Not every business relationship requires insurance, e.g. if the customer is a government, a blue chip company or a member of the same group. Credit insurance is not only about indemnifying losses incurred from a default, but also providing businesses with the support and expertise to improve their risk management. Credit insurers offer actionable economic knowledge, making them information providers rather than pure risk carrier. Many governments acted quickly in the COVID-19 crisis and, by means of state protection shields, enabled credit insurers to maintain their limits – for the benefit of their customers and the economy at large.<sup>53</sup>

### Liability insurance

Businesses could face a number of different types of claims for compensation if they are perceived to have been negligent in their response to the COVID-19 pandemic. For example, employees that are infected by the disease may claim compensation for lost wages if they believe they were infected during employment, which could invoke coverage under workers/employee compensation insurance.<sup>54</sup> Publicly-traded companies may also face shareholder claims if company management is accused of not taking appropriate steps to manage the impact of the pandemic. A first securities class action was launched in mid-March against Norwegian Cruise Line Holdings related to its management of the coronavirus crisis.<sup>55</sup>

### Health insurance

In countries where health care costs are covered by the state or through a state-mandated social security coverage, these costs will be covered. In countries that rely significantly on private insurance markets to provide coverage for health care expenses, there may be gaps in insurance coverage for coronavirus and COVID-19 related expenses.

The analysis of the Geneva Association (see also Figure 1) shows that life- and health-related pandemic risks are generally non-systemic in nature and covered by most mortality- and morbidity-based policies, at affordable prices and with wide availability. Life and health insurers are able to model pandemic risk and price it accordingly. Even though existing protection gaps may have been exacerbated by the pandemic, they seem to be addressable based on the risk appetite, capacity and expertise of the private sector.<sup>56</sup>

51 EIOPA (2019), [https://www.eiopa.europa.eu/content/eiopa-identifies-consumer-protection-issues-travel-insurance-and-issues-warning-travel\\_en](https://www.eiopa.europa.eu/content/eiopa-identifies-consumer-protection-issues-travel-insurance-and-issues-warning-travel_en)

52 OECD (2020), <http://www.oecd.org/finance/insurance/Initial-assessment-of-insurance-coverage-and-gaps-for-tackling-COVID-19-impacts.pdf>

53 Geneva Association (2020), op. cit.

54 [Coronavirus-Impact-On-Casualty-Claims-COVID.aspx \(aon.com\)](#)

55 [Coronavirus Covid-19 Effects on Directors and Officers \(D&O\) Insurance | Robins Kaplan Law Firm LLP](#)

56 Geneva Association (2020), op. cit.

Figure 1: Illustrative summary assessment of obstacles to insuring pandemic risk

	 Business interruption	 Mortality	 Health
Randomness/independence of loss occurrence	●	▲	▲
Maximum possible loss	●	▲	▲
Average loss per event	●	■	▲
Number of exposure units	●	▲	▲
Information asymmetries	▲	▲	▲
Insurance premiums	●	▲	▲
Cover limits	●	■	▲
Public policy	■	■	■
Legal restrictions	■	■	■

● Prohibitively high barrier to insurability    ▲ Manageable barrier to insurability    ■ Insignificant barrier to insurability

Source: The Geneva Association

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