

Open source frameworks for systemic risk

**Supporting global recovery and
resilience for customers and economies**

The insurance industry response to COVID-19

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Disclaimer

The conceptual frameworks and proposals set out in this paper are designed to bring consumer and public benefit by promoting competition and innovation of initiatives that could be developed through appropriate partnership between the insurance industry, government and customers. The proposed solutions are intended for consideration where particular cover for large scale systemic risks is not commercially available to customers in any particular jurisdiction and pooling and other collective action is therefore necessary to create the capacity to provide solutions to customers. Structures given are by way of illustration or example only. Any solutions would need careful competition law consideration in the relevant jurisdiction and discussion with relevant regulators before any steps were taken to implement the consultation proposals.

Open source frameworks

Open source frameworks

This document outlines open source frameworks for three of the potential structures outlined in *Supporting global recovery and resilience for customers and economies*, the paper developed by Lloyd's in response to the COVID-19 crisis and in preparation for future systemic risks.

These open source frameworks provide a blueprint for the insurance industry to help strengthen societal resilience in the face of black swan events.

The three frameworks are as follows:

- **Open source framework 1: ReStart**
- **Open source framework 2: Recover Re**
- **Open source framework 3: Black Swan Re**

This paper sets out a conceptual framework for each structure to support discussions in different jurisdictions across the globe, including:

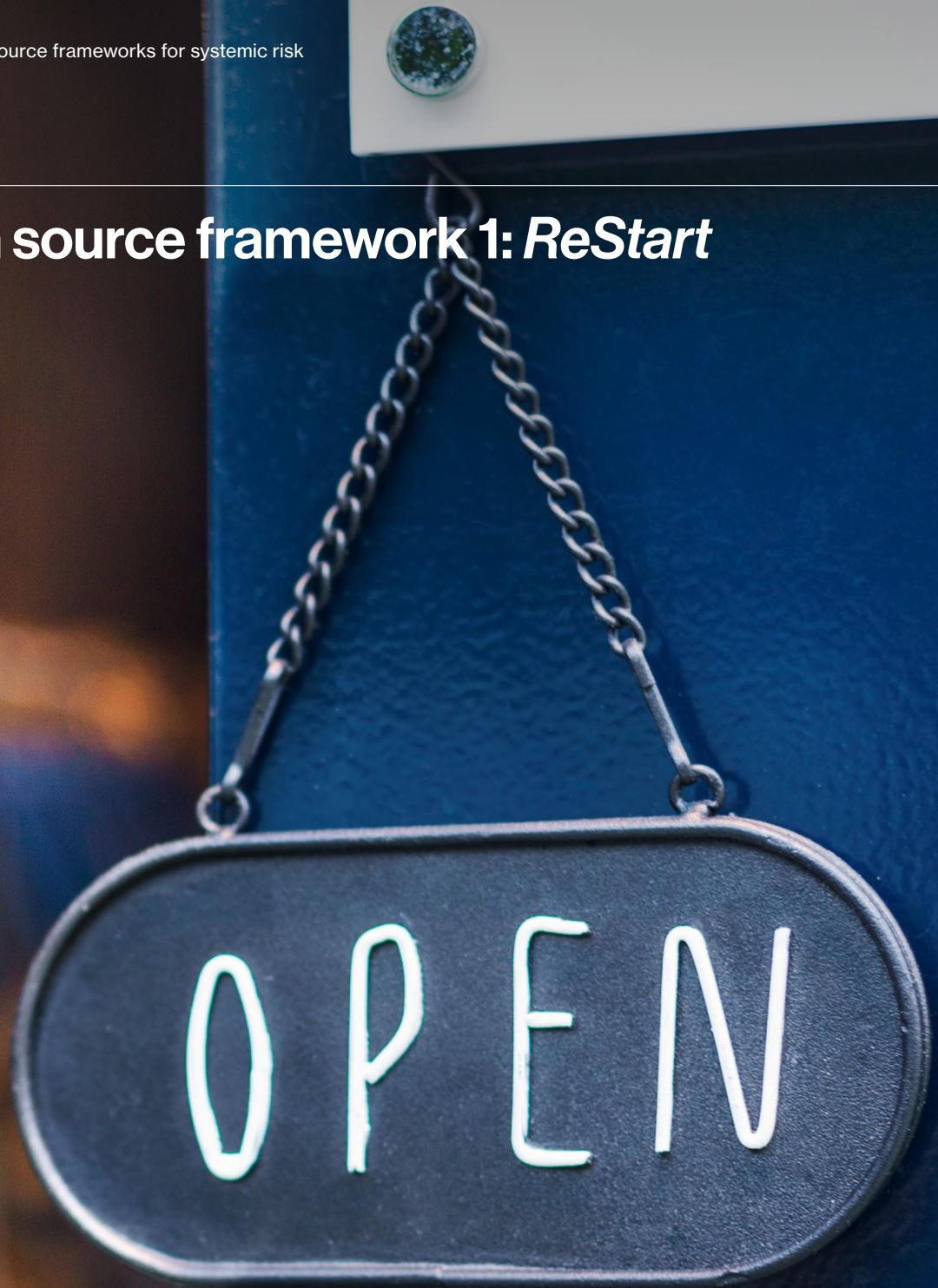
- An overview of how each framework could work, key benefits, and the role of the insurance industry and government (where applicable)
- In addition, the Recover Re section includes an illustrative example of how the framework could work in practice, with example cashflows and accounting and capital implications, because these are important components of the feasibility and attractiveness of the structure

These frameworks could be implemented nationally or regionally, and would need to be adapted for local regulatory requirements and standards, and are, of course, subject to local competition law considerations on which advice should be taken.

Comparison of proposed features of the three frameworks

	ReStart	Recover Re	Black Swan Re
Overview	Insurance pool to offer non-damage business interruption coverage for future waves of COVID-19	'After the event' insurance product, providing immediate cover for non-damage business interruption, including COVID-19, with premiums charged over the long term	Government-backed industry pool for systemic risk, reinsuring commercial non-damage business interruption cover
Coverage offered	– Non-damage business interruption coverage for potential future waves of COVID-19 where commercial cover is not available	– Non-damage business interruption coverage for potential future waves of COVID-19 where commercial cover is not available – Non-damage business interruption cover for future pandemics – Could include cover for other systemic events	– Government-backed reinsurance of non-damage business interruption cover for future systemic events where commercial cover is not available – Could also provide cover for secondary impacts of future events such as supply chain disruption – Would enable greater provision of non-damage business interruption cover
Pricing and affordability	– Premiums charged upfront for annual policy	– A flexible pricing mechanism would allow insurers to recover upfront claims costs over a long period (e.g. 10-15 years), ensuring affordability for customers	– Full risk cost may not be passed to customers given government backstop
Structure and funding mechanisms	– Pooled capacity from insurers to provide targeted non-damage business interruption cover directly to businesses – Participating insurers could ensure the product is affordable to customers and manage their own exposure through a number of measures, including risk pooling, variable, limits and industry or geographical diversification	– Recover Re is a direct non-damage business interruption product aimed directly at businesses – Multi-year contract with requirement for mandatory premium payments over the full term, or cancellation penalty to ensure insurers' claims costs are recovered	– Industry-pooled capital would reinsure insurers offering primary cover for future systemic events – Backed by a government guarantee should the pooled assets become exhausted
Risk borne by government	– No requirement for a government backstop	– Government may be required to guarantee policyholders' future premiums to mitigate the risk of them defaulting on payments – If early event of significant scale, government may be required to provide initial cashflow to cover claims payments in the early part of the policy term – Option for credit risk mutualisation to minimise government contingent liability	– Government would take on the excess claims for non-damage business interruption beyond an agreed insurance industry retention
Scale, target segments	– Relatively small scale and targeted initially at smaller SMEs, with scope to expand over time – Optional for customers	– Targeted at specific SME economic segments to manage liquidity – Would either need to be a compulsory or long-term contract	– Broadest coverage – reinsuring all national systemic risk non-damage business interruption cover beyond agreed retentions – May need to be either mandatory to offer or to obtain, to ensure meaningful take up, otherwise there may be a presumption that government will continue to provide implicit cover

Open source framework 1: ReStart



Open source framework 1: ReStart

Overview of the framework

ReStart is a commercial structure for pooling risk between insurers to support SMEs with their return to work. It is currently being developed within the Lloyd's market to pilot with UK SMEs.

Many industry segments - and SMEs in particular - have suffered significantly since the onset of the COVID-19 pandemic. Lockdowns have restricted the ability of SMEs to operate. The smaller nature of these businesses means that recovery will be challenging and heavily dependent on cashflow. A second wave of COVID-19 would exacerbate this situation and could lead to insolvencies.

Going forwards, customers will seek competitive insurance solutions which protect them from the financial consequences of business interruptions caused by a second and subsequent waves of the pandemic. If cover cannot be provided affordably then many businesses are likely to operate without it.

The insurance market needs to respond to this need even though there are several challenges to doing so.

The key benefits of *ReStart* for customers include:

- Resilience for a key sector of the economy and support for the recovery from COVID-19
- Certainty of business interruption coverage for a second wave of COVID-19 to customers where few alternatives are available
- Contributes directly to customers and their recovery from COVID-19, helping strengthen customer relationships over time
- Manages customer affordability and insurers' exposure through risk pooling, variable limits and industry or geographical diversification

Developing a *ReStart* product should be achievable in 2 to 3 months from commencement, though a launch could be aligned with 1/1 renewals once the likelihood of further waves of COVID-19 becomes clearer.

It will still be subject to the usual Lloyd's performance management requirements and competition law considerations. This structure is given by way of example only and all insurers are of course free to provide cover on any terms they wish.

1. Considerations for coverage offered and risk covered

ReStart could specifically target future waves of COVID-19 to protect SMEs

Consideration	Design options	Implications
Types of risks covered	<ol style="list-style-type: none"> 1. Pandemic-related non-damage business interruption – difference in conditions with existing business interruption 2. Potential to include Employers Liability or Public Indemnity cover, given emerging concerns around return to work liabilities 	<ul style="list-style-type: none"> - The product should provide certainty of business interruption coverage for any future waves of COVID-19 - Could be offered as standalone or as an extension of existing products - A clear definition, trigger and wordings are vital to avoid potential disputes around claims - Potential lack of diversification, high correlation with market risk and increased exposure to a live risk
Approach to defining triggers	<ol style="list-style-type: none"> 1. Evidence of specific event: international body or government announcement (e.g. local lockdown due to COVID-19) 2. Evidence of business disruption: business metrics such as a drop in economic activity or an increase in absenteeism rates, or a government/regional mandated lockdown 	<ul style="list-style-type: none"> - A trigger should be designed which ensures claims are paid when affected policyholders need it most, while avoiding those that are unaffected - The trigger should remain relevant after the first year of policy (i.e. beyond any potential second wave of COVID-19) - Future lockdown restrictions may be applied at a local level as opposed to the current national lockdown

2. Additional considerations

By targeting smaller SMEs, *ReStart* could benefit a large number of customers while diversifying risk

Consideration	Options	Implications
Target customer base	<ol style="list-style-type: none"> 1. Defined by geography, industry or customer sector 	<ul style="list-style-type: none"> - Product should provide protection to key sectors of the economy. Smaller SMEs are obvious candidates given the issues this sector has faced and the lower capacity they require compared to larger businesses - A broader geographic and sector scope offers larger potential diversification benefits to insurers, but requires larger capacity and is more complex to launch

Open source framework 2: Recover Re



Open source framework 2: Recover Re

Overview of the conceptual framework

Recover Re is an ‘after the event’ insurance product, which could provide immediate relief and cover for non-damage business interruption, including the current COVID-19 pandemic, over the long term.

This could be an efficient way of getting commercial and government capital into the economy, providing relief to those customers with limited borrowing capacity and providing cover where it cannot be offered on commercial terms.

The key benefits of Recover Re for customers include:

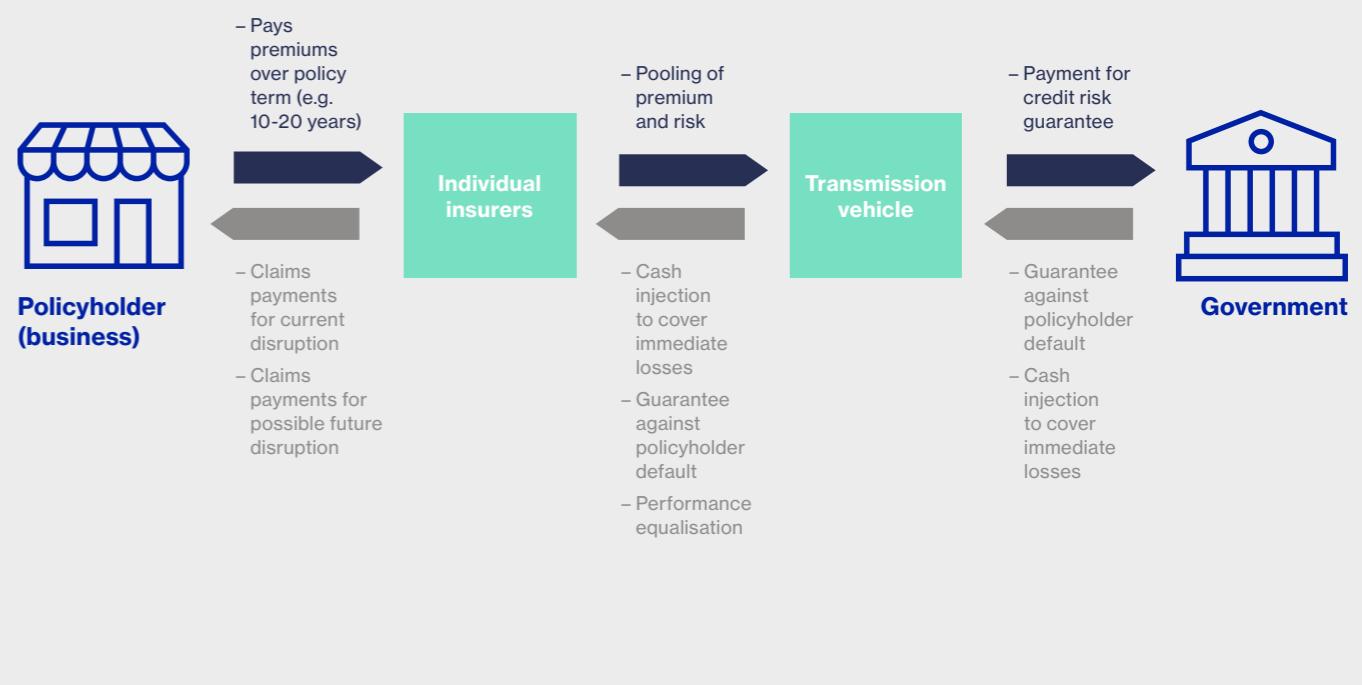
- Immediate cash injection and recovery support, paid for over the long term
- Non-damage business interruption coverage for future waves of the COVID-19 pandemic should disruption continue past a specified time period or when losses exceed a specified excess
- Non-damage business interruption cover for future pandemics; it could also include other systemic events, but this would add complexity and could delay launch
- Cover against secondary impacts of future events, such as supply chain disruption

Role of the insurance industry: to provide the risk management expertise and infrastructure to inject capital into the economy by directly supporting SMEs affected by the current pandemic and which are likely to be impacted by future waves.

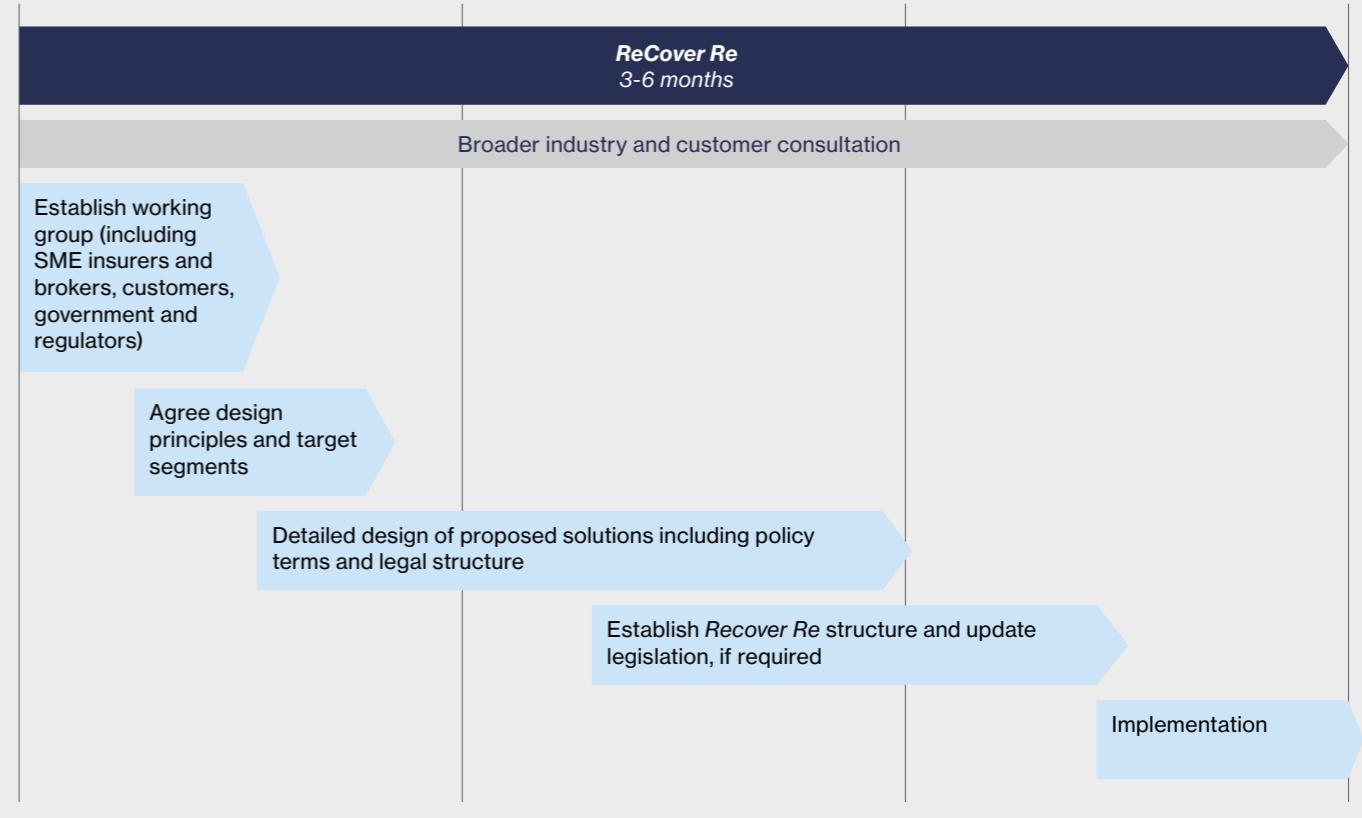
Role of government (if required): provide initial cashflow to cover claims payments in the early part of the policy term, and well as guarantee premiums to mitigate the risk of customers defaulting on payments.

There are numerous design options to consider, with implications for fairness, affordability and attractiveness for customers, as well as potential accounting and capital benefits for both customers and insurers. Designed correctly, Recover Re avoids the insured’s balance sheet from being negatively impacted by ongoing liabilities and provides an immediate cash injection at the time of the customer’s need.

A graphical representation of how Recover Re could work:



Illustrative timeline for implementing Recover Re



Open source framework 2: Recover Re

1. Coverage offered

Recover Re would provide non-damage business interruption coverage for a potential future wave of COVID-19, as well as for cover for future pandemics and other systemic events.

Consideration	Design options	Implications
Types of risks covered	The cover for non-damage business interruption could be triggered: <ol style="list-style-type: none"> 1. In the case of pandemics only 2. Could also include broader systemic events 	<ul style="list-style-type: none"> - There is an opportunity to broaden the scope of this product beyond pandemics. However, careful thought will be needed to define the triggers of future systemic risks, which are hard to define or anticipate. This could delay the launch of a product which has immediate application - Cover could be limited (e.g. to staff costs) to make the premiums more affordable
Approach to defining triggers	<ol style="list-style-type: none"> 1. The use of dual triggers for claim payments is one potential option, for example: <ul style="list-style-type: none"> - Evidence of specific event: World Health Organisation pandemic declaration, utility capacity drops by x%, global crop yields drop by x% - Evidence of business disruption: an x% drop in economic activity or a government-mandated lockdown <ol style="list-style-type: none"> 2. An alternative or parallel approach would be to allow government to trigger or certify a loss event. This approach has precedent in some jurisdictions - for example, terror events in the UK 	<ul style="list-style-type: none"> - Given the variety and nature of systemic risks, setting the appropriate triggers to identify when claims should be paid is invariably going to be complex - There should be a way of identifying both what is covered in the insured's policy and what is passed through to a reinsurance pool
Excess and limits	<ol style="list-style-type: none"> 1.'Waiting period' before claims payments kick in and/or 2. Meaningful limit (individual or aggregate) on losses 	<ul style="list-style-type: none"> - It is likely that both a 'waiting period' and loss limit per event or in aggregate would be required to make the product viable for insurers to offer. However, this needs to be balanced by its attractiveness and usefulness to customers
Claims payments	<p>The benefit amount or loss amount for claims could be based upon:</p> <ol style="list-style-type: none"> 1. Prior years' accounts 2. A formulaic approach e.g. % of rateable value 3. An option to make partial payments for partial business interruption, e.g. if the business can operate at 20% capacity, payments would be made at 80% of full business interruption <p>If a simple approach was taken, there would be the option to reconcile it against actuals afterwards</p>	<ul style="list-style-type: none"> - Simplicity is likely to be key to making this product successful, particularly for use in the current situation. However, several nuanced caveats may be helpful to consider in order to enhance the attractiveness and/or usefulness of the product

2. Approach to pricing and affordability

As part of the proposed framework, a pricing mechanism would be in place to allow insurers to recover upfront claims costs over the length of the policy term (circa 10-15 years), ensuring affordability for customers.

Consideration	Design options	Implications
Pricing considerations	<ol style="list-style-type: none"> 1. Fixed premium 2. Variable premium with an increase following loss payment 	<ul style="list-style-type: none"> - A mechanism that is flexible and allows premiums to adapt after a loss is incurred makes the product more affordable and spreads costs over a longer period for the policyholder - Adapting premium post-event rather than fixing premium upfront, requires far less modelling and pricing expertise for these risks
Premium over time	<p>The premium amounts paid over time could:</p> <ol style="list-style-type: none"> 1. Remain level 2. Step up over time as businesses recover 	<ul style="list-style-type: none"> - Premiums could be increased over time to make the policy more affordable upfront and avoid additional strain during the recovery. However, weighting the premium payments during COVID-19 recovery to be greater in later years could increase the level of credit risk
Payment frequency	<ol style="list-style-type: none"> 1. Premiums paid monthly 2. Premiums paid annually 	<ul style="list-style-type: none"> - Administration costs could be impacted (as monthly payments could mean more administrative cost) but should largely be a matter of policyholder convenience and required cashflows to meet necessary business obligations
Policy term	<p>The policy could be designed as either:</p> <ol style="list-style-type: none"> 1. Fixed term 2. Fixed term, which is extended upon future claims event 3. Compulsory, annual renewable cover 	<ul style="list-style-type: none"> - The suggested structure and long-term nature of the policy, including the ability of the policyholder to switch insurers, is likely to have competition law and customer fairness implications which would be the material and would need to be addressed - A mechanism must be put in place to allow insurers to recover upfront claims costs over a long period to ensure the affordability and viability of the product - The 'compulsory' nature of the cover, in light of a targeted rollout, raises further considerations, but this could be managed by making it compulsory once customers have opted in - Finite (re)insurance products (such as mortgage indemnity) were popular in the past, but resulted in tax and accounting complexities

Open source framework 2: Recover Re

3. Structure and funding mechanisms

Recover Re would be a non-damage business interruption product for pandemics aimed directly at businesses. The contract would be a multi-year or compulsory product, allowing insurers to recover their positions over time. There would be a requirement for mandatory premium payments over the full term or a cancellation penalty to ensure costs are recovered.

Consideration	Design options	Implications
Portability	Valuation	<ul style="list-style-type: none"> – The portability of the product between insurers will be important to address any competition law or customer fairness concerns – Additional considerations around pricing, insurer expenses and profitability will need to be worked through to determine how portability would work – A clear, well-governed methodology for balances applied to the experience account to facilitate portability
	Frequency	<ul style="list-style-type: none"> – A mechanism and/or body to facilitate and administer transfers as well as adjudicate transferring balances would be required should the policyholder go insolvent before losses are recovered
	Additional considerations	<ul style="list-style-type: none"> 1. Adjustment for investment income and underwriting loss
Where risk sits within the industry	<ul style="list-style-type: none"> 1. The insurance contract could be between individual policyholders and the insurer; thus, the risk would sit on the individual insurer's balance sheets 2. Alternative structures could be explored to allow insurers to carry this risk off their balance sheets 	<ul style="list-style-type: none"> – The accounting and capital implications resulting from the rest of the design may impact how insurers wish to manage this risk - on their balance sheet or otherwise

4. Risk borne by government

The Recover Re framework may require government to guarantee policyholders' future premiums to mitigate the risk of them defaulting on payments. If of significant scale, government may be required to provide initial cashflow to cover claims payments in the early part of the policy term.

Consideration	Design options	Implications
Transfer of risk to government	Risk borne by government	<ul style="list-style-type: none"> – Given the target market and long-term nature of this product, a government guarantee of the future premium flows will be critical to make this affordable for the customer
	<ul style="list-style-type: none"> 1. The credit risk of Recover Re would be significant and would need to either be mutualised or passed to government. It is expected that government would provide a backstop such that when business is declared insolvent, government pays the outstanding balance due 2. Recover Re could mutualise the credit rather than passing it to government, to make it more clearly an insurance product and to reduce the burden on government 	<ul style="list-style-type: none"> – The ability of the policyholder to annul their liability in the scheme as a matter of last resort should allow them not to have to recognise the full future premium costs on their balance sheet as a liability – As government would carry the credit risk, there would need to be the relevant legal and administrative mechanisms in place to compensate the insurer
	Entity taking on the credit risk	<ul style="list-style-type: none"> – Depending on the size and scope of the scheme there may also be a requirement for government to provide liquidity support to the industry, although this would only be expected in the case of a large scale roll-out – Government is likely to expect to be compensated
	Administration	<ul style="list-style-type: none"> 1. How will defaults under the scheme be adjudicated, valued and administered? 2. Will payments be made directly from government to the insurer or via an

Open source framework 2: Recover Re

5. Scale, target segments and compulsory nature

Given the immediate liquidity considerations it is likely that *Recover Re* would need to be targeted at specific economic segments, such as the worst-affected SME sector, to provide immediate cashflow relief.

Consideration	Design options	Implications
Target customer base	<ol style="list-style-type: none"> SME businesses are one logical target for <i>Recover Re</i> as they are likely to be more vulnerable to some of the systemic risks highlighted. This is due to potentially having relatively lower cash reserves and less ability to adapt quickly to the challenges posed by systemic risk events There is also the potential for this type of structure to support the economy more broadly and offer support to mid to large-scale businesses 	<ul style="list-style-type: none"> – Targeting subsets of the economy may present implementation challenges and the potential to unintentionally exclude certain at-risk areas of the economy – A less absolute way to target support could be to design claims pay-outs in such a way that they disproportionately benefit smaller businesses
Compulsory nature and interaction with other covers	<ol style="list-style-type: none"> There may be a demand for <i>Recover Re</i> without any compulsion Alternatively, offering coverage could be mandatory, with clear guidance on how insurers and intermediaries must present and offer coverage. This could potentially be attached to existing compulsory covers, for example, Employer's Liability 	<ul style="list-style-type: none"> – Uptake of cover could present a challenge as government has already set a precedent to intervene in the occurrence of a systemic event. This means incentives to buy cover will need to be well thought through – Making the purchase of cover mandatory could raise competition law and customer fairness issues, although different jurisdictions take different approaches to mandatory cover – Interactions with other government stimuli should be considered

Open source framework 2: Recover Re

Recover Re in practice

The case study below uses an example of a restaurant potentially covered by 'after the event' insurance.

A restaurant with a rateable value (or equivalent commercial tax banding measure) of \$20,000, currently closed due to lockdown measures, purchases a *Recover Re* policy on 1 July 2020. The policy covers 50% of rateable value (\$10,000). Premiums would also be paid monthly and adjusted over time, depending upon the accrued losses, subject to a minimum and maximum premium, and paused during periods of disruption/loss events.

This policy begins while lockdown is still in place for the restaurant sector and continues for five months until 30 November. During the first month a waiting period applies in which no claims payment can be made (and, equally, no premium is collected), after which time the policyholder receives their monthly claims payment for the following four months.

	31/07/20	31/08/20	30/09/20	31/10/20	30/11/20	31/12/20
Payments to policyholder	–	\$10,000	\$10,000	\$10,000	\$10,000	–
		<i>First payment made after waiting period</i>				<i>Payments stop after lockdown</i>

When the lockdown lifts on 1 December, the restaurant owner begins paying compulsory premiums of \$272 per month (the rate required to pay back claims costs over the policy term of 15 years).

	31/07/20	31/08/20	30/09/20	31/10/20	30/11/20	31/12/20
Pure Premium	\$0	\$0	\$0	\$0	\$0	\$228
Expense and profit loading	\$0	\$0	\$0	\$0	\$0	\$44
Premium paid	\$0	\$0	\$0	\$0	\$0	\$272
		<i>Premium payments paused during disruption</i>				

Open source framework 2: Recover Re

Recover Re in practice

On 1 April 2033, the insured is affected by another black swan event that triggers a four-month lockdown. During this time their premiums are paused and claims pay-outs resume at a inflation-adjusted amount of \$13,785.

	30/04/33	31/05/33	30/06/33	31/07/33	31/08/33
Payments to policyholder	–	\$13,785	\$13,785	\$13,785	–
	<i>One month waiting period applies again</i>		<i>Claim payments inflated over time</i>		

Post lockdown, the premiums are adjusted to reflect the increased level of accrued losses (reflecting premiums already paid to date for the 2020 event); this results in an increased premium amount of \$320 per month.

	31/07/20	31/08/20	30/09/20	31/10/20	30/11/20	31/12/20	–	31/03/33	30/04/33	31/05/33	30/06/33	31/07/33	31/08/33	30/09/33	31/10/33	30/11/33
Pure 'premium'	\$0	\$0	\$0	\$0	\$0	\$228	–	\$228	\$0	\$0	\$0	\$0	\$270	\$270	\$270	\$270
Expense and profit loading	\$0	\$0	\$0	\$0	\$0	\$44	–	\$44	\$0	\$0	\$0	\$0	\$50	\$50	\$50	\$50
Premium paid	\$0	\$0	\$0	\$0	\$0	\$272	–	\$272	\$0	\$0	\$0	\$0	\$320	\$320	\$320	\$320
	<i>Premium payments paused during disruption</i>		<i>Premium payments calibrated to recoup claims costs over time</i>		<i>Premium payments paused during disruption</i>			<i>Premium stepped up to reflect updated experience balance</i>								

Open source framework 2: Recover Re

Recover Re in practice

The insured continues paying premiums at this level until the total cost of claims previously paid is reached (which could be over the 15-year policy term). After this point the customer pays a lower premium to accrue a buffer for future events and retain cover. If the customer goes out of business before the end of the policy term, government would step in to provide the shortfall to the insurer.

	31/07/20	31/08/20	-	30/11/20	-	31/12/25	30/04/33	31/05/33	30/06/33	-	31/07/37
Cumulative 'pure premium'	\$0	\$0	-	\$0	-	\$13,943	\$34,057	\$34,057	\$34,057	-	\$47,030
Cumulative claims paid	-	\$10,000	-	\$40,000	-	\$40,000	\$40,000	\$53,785	\$67,570	-	\$81,355
Total value	\$0	-\$10,000	-	-\$40,000	-	-\$26,057	-\$5,943	-\$19,728	-\$33,513	-	-\$34,325
<i>In this case there is no time to build up a surplus before the first claim is paid because the policy starts during a lockdown</i>						<i>Government repays deficit from the experience account when insured defaults</i>					

Open source framework 2: Recover Re

Accounting and capital implications

The Recover Re framework could have the following accounting implications for the insurer and the customer:

For the insurer

- **On profit and loss:** whilst the contract in the first year is likely to be loss-making, the insurer will not necessarily need to recognise this in the P&L in year one, depending on the accounting treatment adopted (e.g. they may be able to recognise the future premium income stream, and thus not have to recognise an unearned loss)
- **On the balance sheet:** future premiums still to be received could be recognised on the balance sheet. In terms of regulatory capital, insurers may be able to recognise future profits from future premium streams and use them as an offset against capital requirements
- **On liquidity:** whilst not a significant strain on their initial balance sheet (in fact potentially the opposite) there will be a significant liquidity strain upfront if claims are immediately payable before insurers receive any premiums

For the customer

Accounting treatment will depend on the detail of any contractual obligation, obligating events, and the level of uncertainty over timing and amount of premiums.

- **On profit and loss:** structural arrangements to achieve recognition of only current year premium outflow and claims inflow is to be explored and may be possible
- **On the balance sheet:** structure and contractual arrangement to be explored that will enable balance sheet liability recognition of only the current year's premium (rather than recognise future year obligations to pay for coverage). Such a treatment would not put the same strain on the balance sheet as a loan agreement

In order to avoid incurring liability for future premiums, the insured would need to be able to avoid paying the premiums or only have the obligation to pay the premiums as business is conducted in future years.

Note: the accounting treatment is highly judgmental, given there is no IFRS accounting standard that addresses policyholder accounting (it is scoped out of IFRS 4 and IFRS 17).

Therefore, it needs to be determined whether the accounting treatment should apply the principles in IAS 37 or those in IFRS 9. There is a risk that the factors required to ensure that the SME would not recognise a liability for all future premiums, could be the factors that would work against the insurer being able to recognise an asset for future premiums. A key next step is to perform detailed assessment to validate that the product can be designed in a way such that the above outcomes are achievable.

Open source framework 3: *Black Swan Re*



Open source framework 3: Black Swan Re

Overview of the conceptual framework

Black Swan Re is an open source framework which would provide coverage for future systemic risks through insurance industry-pooled capital, with a guarantee from government to pay out if ever the pool had insufficient funds.

The losses arising from systemic risks aggregate across policies and are often difficult to predict or model, and as a result they are largely uninsurable within the existing infrastructure.

In identifying the protection gaps an insurance industry and government partnership could address, there are two risk areas to consider:

- Risks excluded by commercial covers
- Key risks on a government's risk register

It is important to consider both factors in turn, both in order to create an efficient use of the commercial market and to avoid competition law issues by demonstrating there is market failure before considering collaborative industry solutions.

These systemic risks could have major economic impacts or cause civil disruption. Such risks can include, but are not limited to:

- **Major public health emergency:** causing mass lockdown, resulting in a significant fall in economic activity and lost revenue
- **Widespread telecommunications or utilities failure:** this could take the form of a global cyber-attack impacting millions of devices across multiple industries and critical infrastructure, or space weather in the form of an extreme geomagnetic solar storm shutting down critical electricity, GPS and transport infrastructure around the world for days or possibly months

- **Food or critical resources supply chain failure:** this could be a significant supply chain shock for critical resources that could have major global economic, political and social effects

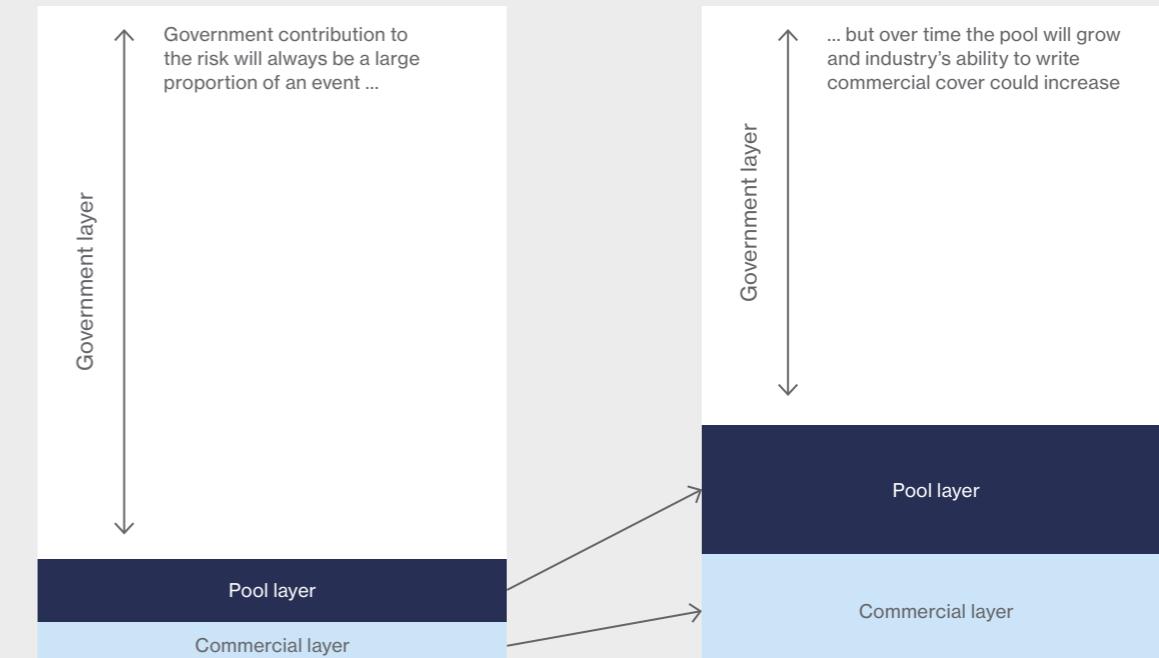
- **Accelerated climate change:** this could act as a risk multiplier, amplifying the effect and frequency and severity of events such as wildfires, flooding and other natural perils, whilst extreme local temperatures could lead to permafrost melting or damage to infrastructure. These events could cause widespread environmental harm as well as disruption to food, water and other critical services. This would lead to geopolitical tensions, and economic and investment market damage

In any of the scenarios above, the aggregate losses could exceed multiple trillions of dollars. Using a government and industry partnership, a robust infrastructure could be built to cover a reasonable proportion of similar future losses. This concept of a public/private partnership is well-established in many jurisdictions around the world.

Through a partnership with the insurance industry, a portion of systemic risk could be covered commercially with a government backstop. This cover can either be built up over time through contributions from insurance policies, paid back after the event or be funded through taxation.

It is expected that the pool would grow over time and be able to absorb larger risks. An insurance industry vehicle would also share knowledge and expertise to support risk mitigation, loss adjusting and, where possible, enable it to take on more of the risk.

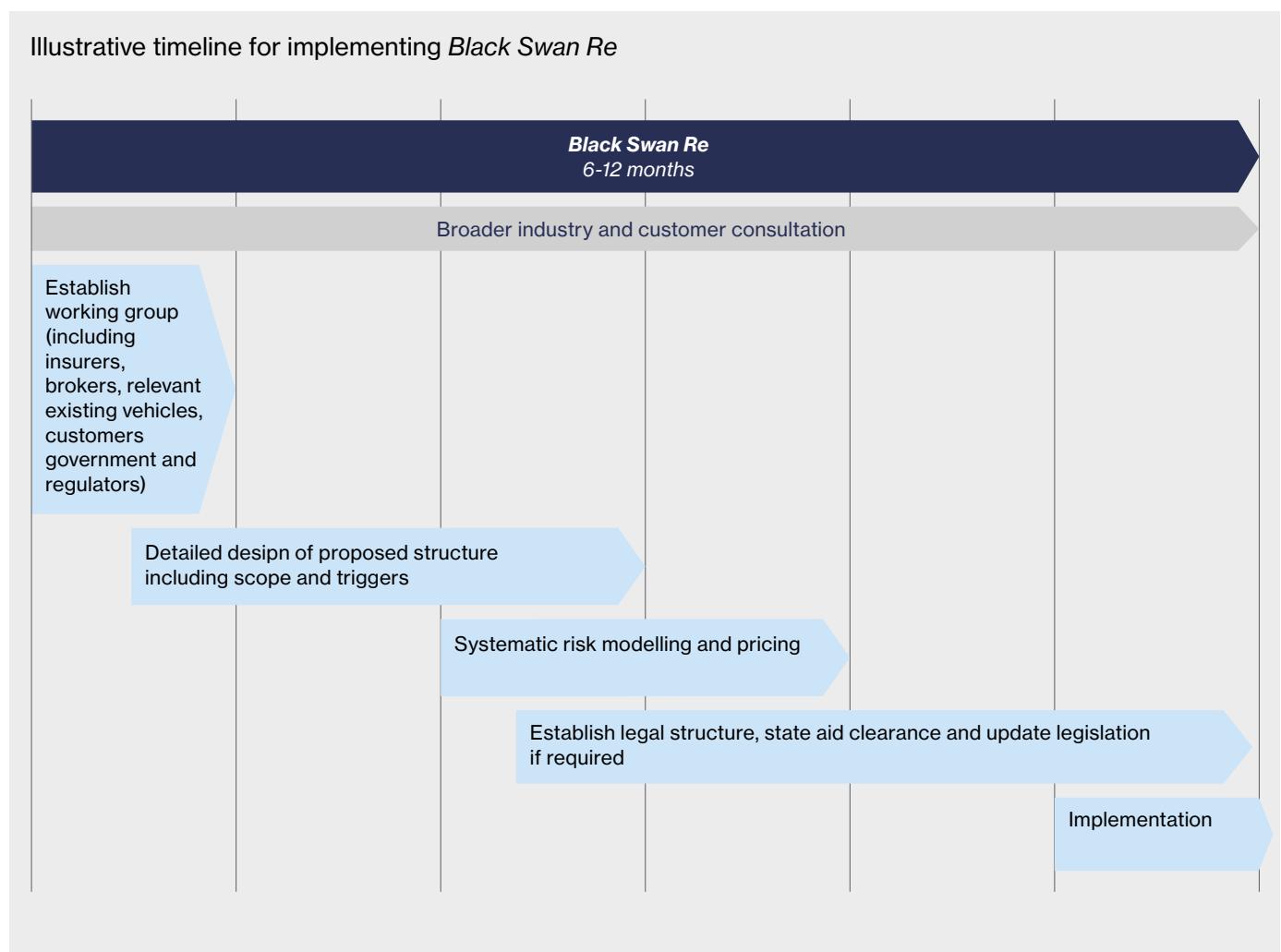
By definition the costs of these types of events would be in the trillions of dollars and, as such, the contribution from any industry partnership would be relatively small in the short term. However, it would provide some buffer and the pool would increase in time.



There are several benefits to such a public private partnership:

- Ensuring that incentives are aligned and society's perception of systemic risk improves will prompt customers to introduce behaviours that mitigate their exposure to these risks
- Brokers can help customers visualise risks not immediately apparent to them and encourage greater protection
- Transferring risk to the commercial sector reduces government's exposure to these systemic risks over time
- Access to proven global insurance expertise to assess and better manage these types of risks and provide loss adjusting capability in times of crisis – presenting the opportunity for a more equitable solution
- Alignment with broader industry products available to policyholders
- Availability of a ready-made infrastructure to funnel government funds to affected parts of the economy

Open source framework 3: *Black Swan Re*



Open source framework 3: Black Swan Re

Systemic risk considerations from existing pooling frameworks

Structural aspect	Options (and example)	Systemic risk considerations
Scope	<ul style="list-style-type: none"> - Single risk pools are fairly common for terrorist attacks - Multiple peril pools have a broader scope, covering a variety of different risks – often plugging gaps in commercial provision 	<ul style="list-style-type: none"> - Single risk pools solve a particular problem at a point in time. The challenge is then returning those risks to the commercial markets to ensure the risks can be reserved and mitigated appropriately - If the scope of risks covered is too broad, it risks crowding out the commercial sector – effectively subsidising businesses at the expense of other taxpayers - A multiple peril pool offers potential diversification benefits
Pooling mechanism	<ul style="list-style-type: none"> - Single risk pool absorbing multiple risk types (e.g. Consorcio de Compensación de Seguros – Spanish catastrophe insurer for risks arising from several defined 'extraordinary events' – including earthquake, flood, terrorism, 'popular tumult', and acts of the armed forces in peacetime) - Single pool for single risk type, managed independently (e.g. EXTREMUS Versicherungs-AG, German terrorism risk pool - commercial property damage and business interruption) - Multiple pools managed collectively, but each for a different risk type (e.g. GAREAT – French terrorism risk pool – separate pools for large risks, and small and medium-sized risks) 	<ul style="list-style-type: none"> - A single pool including multiple risks amasses capital from a broader base and is therefore able to offer more protection than any single risk pool alone - Single risk pools ensure individual businesses' contributions are allocated to the specific risk covered, and can be more attractive to commercial reinsurers or capital markets taking on risk from the pool
Funding mechanism	<ul style="list-style-type: none"> - Ex ante/pre-funding (e.g. US National Flood Insurance Programme – offers flood cover to US property owners, up to a maximum insured value) - Ex post/post funding (e.g. TRIA – US terrorism risk backstop – recoverable federal support provided once industry losses reach a pre-determined trigger level) 	<ul style="list-style-type: none"> - Ex-ante funding can reduce the burden on the state, but actuarial pricing and risk mitigation incentives are needed to ensure a meaningful buffer before government incurs liabilities - For a systemic risk pool this could mean very high contribution requirements – particularly difficult in recessionary conditions - For ex-post structures, it is critical to identify the right level and parameters for industry liability in order to maximise the level of risk that can be viably absorbed by the insurance industry, and to provide clarity on the level of exposure that participants will incur

Systemic risk considerations from existing pooling frameworks (continued)

Structural aspect	Options (and example)	Systemic risk considerations
Primary or reinsurance	<ul style="list-style-type: none"> - Primary (e.g. Elementarschadenpool – Swiss Nat Cat pool, offers cover for 'elemental perils', such as flood, storm, hail, avalanche, rockfall - included in property policies) - Reinsurance (e.g. Pool Re – UK terrorism pool – mutual reinsurer with government surety meeting losses in excess of its capacity) 	<ul style="list-style-type: none"> - Primary cover provided by the state pool can directly ensure provision at an affordable price - Reinsurance-based pool structures enable commercial pricing of the underlying risk and thus incentivise risk mitigation - as well as facilitating retention of risk by insurers
Extent of government liability	<ul style="list-style-type: none"> - No government liability (e.g. Österreichischer Versicherungspool zur Deckung von Terrorrisiken - Austria terrorism pool); capped government liability (e.g. TRIA – US terrorism risk backstop: \$100bn per annum aggregate cap) - Unlimited government liability (e.g. Pool Re – UK terrorism pool backed by unlimited government surety for losses exceeding c. £6.5bn capacity) 	<ul style="list-style-type: none"> - In theory, capped liability schemes offer a means to incentivise policyholders as well as insurers to mitigate their losses from a major loss event; in practice, especially for systemic events, it is questionable how differently they would act
Participation	<ul style="list-style-type: none"> - Mandatory (e.g. Consorcio de Compensación de Seguros – compulsory contributions for various policy types to compensate for losses from specified 'extraordinary events') - Elective (e.g. EXTREMUS Versicherungs AG, German terrorism risk pool – cover can also also be offered without cession to the pool) 	<ul style="list-style-type: none"> - Elective schemes can be structured to incentivise risk mitigation while offering affordable cover that would otherwise not be available - However, for systemic risks, unless there is mandatory participation, the scheme may fail to garner sufficient funds/take-up to provide a meaningful level of insurer loss absorption prior to government support

Open source framework 3: *Black Swan Re*

1. Coverage offered

Black Swan Re could provide non-damage business interruption cover for future systemic events only. It could also be used to provide cover for secondary impacts of future events, such as supply chain disruption.

Consideration	Design options	Implications
Types of risks covered	<ol style="list-style-type: none"> Example systemic 'black swan' events that could be covered are outlined earlier in this document There is potential to develop the <i>Black Swan Re</i> solution for one risk at a time, beginning with pandemic risk, and expanding the coverage to include additional risks over time 	<ul style="list-style-type: none"> <i>Black Swan Re</i> presents an opportunity to create resilience to a broad set of systemic risks that present severe economic and civil disruption threats to a country An industry partnership would give governments the opportunity to add additional mitigations and risk management approaches to managing some of the key systemic events on national risk registers There is a trade-off between how broadly <i>Black Swan Re</i> is used to build economic resilience, industry appetite and the complexity inherent in implementing it. Building infrastructure to cover additional systemic risks, beyond pandemics, would take longer and add to the complexity
Approach to defining triggers	<ol style="list-style-type: none"> The use of a dual trigger for claims payments is one potential option, for example: <ul style="list-style-type: none"> Evidence of specific event: World Health Organisation pandemic declaration, utility capacity drops by x%, global crop yields drop by x% Evidence of business disruption: a x% drop in economic activity, or government-mandated lockdown An alternative or parallel approach could be to allow government to trigger or certify a loss event. This approach has precedent in some jurisdictions e.g. terror events in the UK 	<ul style="list-style-type: none"> Given the variety and nature of systemic risks, setting the appropriate triggers to identify when claims should be paid is invariably going to be complex There should be a way of identifying both what is covered in the insured's policy and what is passed through to the reinsurance pool The structure should not aim to pass all risks through to a reinsurance pool, although it may want to offer a broader product to customers There is potential to develop an index that gives early warning indicators of the societal impacts, and could also be designed in such a way to act as a trigger, loss estimation or pricing tool

2. Approach to pricing and affordability

Black Swan Re would only price for future risks, so immediate premiums would likely be smaller than those of the other frameworks. It is likely the full risk cost may not be passed to customers, given the government backstop.

Consideration	Options	Implications
Pricing approach	<p>For the primary non-damage business interruption:</p> <ol style="list-style-type: none"> Relative risk pricing could be set by the primary insurer based upon the commercial risk retention. Retention levels could be set to ensure affordability for the customer Alternatively, a fixed premium relative to coverage provided could be charged to all policyholders <p>For the <i>Black Swan Re</i> pool funding:</p> <ol style="list-style-type: none"> A relative risk pricing could also be applied, recognising the challenges in pricing these kinds of risks, particularly initially as capability is built. The price could deliberately be set below the full risk cost to ensure it remains affordable for the end customer The pool could be funded by a levy across a range of insurance policies 	<ul style="list-style-type: none"> Different jurisdictions and pool structures take very different approaches to funding, and these have impacts on individual incentives and behaviour Relative pricing could encourage the insurance industry and businesses to assess the risks better and encourage risk mitigations to be put in place Cover would need to be affordable so the costs of primary cover would need to be monitored, retentions set carefully, and potentially capped if there was not sufficient competition A risk-based pricing approach would be expected to encourage better risk management and risk behaviour but is likely to make the product unaffordable. Using technical risk modelling to inform relativities in pricing could provide an optimal trade off Charging a fixed price regardless of risk factors could miss the opportunity to incentivise risk mitigation behaviours

Open source framework 3: *Black Swan Re*

3. Structure and funding mechanisms

The *Black Swan Re* reinsurance structure would provide insurance industry-pooled capital to enable insurers to provide coverage for future systemic events. This framework would provide an initial commercial and industry-pooled layer of funds, backed by a government guarantee should the pooled assets become exhausted.

Consideration	Design options	Implications
Funding mechanisms	1. The <i>Black Swan Re</i> structure could be funded, at least in part, through a pool of capital built up by the industry to cover losses	<ul style="list-style-type: none"> – In the short term it would be difficult to build up enough funds to provide a meaningful buffer, relative to the overall cost of these systemic events; however, the capital pool would provide some contribution to losses that would grow over time
	2. Alternatively, government could cover losses on a pay-as-you-go basis, funded through premium increases or taxes after the event. In the latter, case the industry and <i>Black Swan Re</i> would be acting purely as a transmission vehicle for government funds	<ul style="list-style-type: none"> – Including a commercial layer could encourage further industry participation over time and provide a centre of excellence for risk management solutions
Proposed structure	<ol style="list-style-type: none"> 1. Existing market structures that have been set up for other types of risks could be broadened to serve a wider set of risks e.g. nuclear pools, terrorism pools or catastrophe pools 2. An independent entity or structure could be established to provide a dedicated black swan solution 3. Where multiple risks are covered by a single pool, consideration should be given to ringfenced balance sheets or otherwise, as well as diversification and access to funds by those who have contributed 	<ul style="list-style-type: none"> – The feasibility, governance provisions and political appetite in a particular jurisdiction will determine whether expanding existing structures is possible or new structures are required – Many jurisdictions already have some form of government and industry partnership structure or pooling arrangement that could be expanded for further perils – Utilising existing structures could accelerate delivery and provide administrative synergies and efficiencies. Given the cost of an insurance solution versus other approaches, using existing pools would minimise implementation and incremental running costs, and could make the proposal more attractive to government

4. Risk borne by government

Black Swan Re would require government to take on the excess claims for non-damage business interruption beyond an agreed insurance industry retention.

Consideration	Options	Implications
Risk borne by government	<p>The level of risk passed on to government would be significant, and could be structured in different ways to manage how risk is passed through:</p> <ol style="list-style-type: none"> 1. The <i>Black Swan Re</i> pool could provide an Excess of Loss (XoL) cover beyond a pre-agreed point (per insurer) for non-damage business interruption, with insurers having the ability to opt in or out 2. The risk that could be passed through to the government layer could be defined by specific perils causing the non-damage business interruption losses, with an attachment point fine-tuned to optimise based on industry appetite 3. Risks taken by government could be unlimited or capped, as has been proposed in some jurisdictions 4. Alternatively, <i>Black Swan Re</i> infrastructure could be used simply to deploy government funds but without a financial pool. This is similar to the Fonden approach in Mexico which is used to payout government funds in response to natural catastrophe events 	<ul style="list-style-type: none"> – It is important to design and evolve a structure that optimises the balance between government and industry risk-taking – Over time, insurance industry retention could increase as risks become better understood and potentially become more readily insurable – It is possible that industry funds would represent a relatively small portion of overall costs, at least initially, but would still provide the ability to rapidly pay claims to those in need through its existing infrastructure – Government is likely to expect to be compensated for carrying risk

Open source framework 3: *Black Swan Re*

5. Scale, target segments and compulsory nature

Black Swan Re could have a broader coverage and scale, given government backing and the ability to build up a pool ahead of the next systemic event. It may need to be made mandatory (or at least mandatory to offer) to ensure meaningful take up, otherwise there may be a presumption that government will continue to provide implicit cover.

Consideration	Options	Implications
Target customer base	<ol style="list-style-type: none"> 1. <i>Black Swan Re</i> could be targeted at those most in need, like SMEs 2. Or made widely available 	<ul style="list-style-type: none"> - Targeting subsets of the economy could present challenges in implementation and the potential to unintentionally exclude certain at-risk areas of the economy - A less absolute way to target support could be to design pay-outs in such a way that they disproportionately benefit smaller businesses to a greater extent - The self-employed have been identified as being particularly vulnerable during COVID-19 and consideration should be given to whether this approach would cater to this section of the economy. An alternative approach may be better suited
Compulsory nature and interaction with other covers	<ol style="list-style-type: none"> 1. Non-damage business interruption cover backed by <i>Black Swan Re</i> could be optional, relying on insurers to offer it 2. Alternatively, offering non-damage business interruption coverage could be mandatory for the insurance industry, with clear guidance on how insurers and intermediaries must present and offer coverage. This could potentially be attached to existing compulsory covers e.g. Employer's Liability in the UK 3. Another approach could be to mandate the purchase of non-damage business interruption cover, ensuring all businesses are covered. This could also be limited to a particular size or type of business 4. The non-damage business interruption cover could be an extension to existing coverage (e.g. existing non-damage business interruption policies) or could be considered as a standalone cover 	<ul style="list-style-type: none"> - Uptake of cover could present a challenge as government has set a precedent to intervene in the event of a systemic event. This means incentives to buy cover will need to be well thought through - The purchase of terrorism cover for SME businesses in the UK is currently less than 5%, which highlights the challenge in ensuring demand and that the uptake of cover is meaningful - Without meaningful take-up from customers or participation from insurers, the pool would struggle to build up any kind of reasonable buffer of funds - Irrespective of take up, government would still likely intervene in the event of a systemic risk occurring, raising issues about the value of the insurance product - If all businesses are made aware of the option to purchase cover and it is offered at a reasonable price, it would be easier for government to rely on the commercial sector for future cover, or act as a distribution mechanism for government funds - The cost of using the insurance industry will be a key consideration for government in deciding if it is an efficient vehicle to support with these risks. If the cover provided is an extension of existing covers rather than a new product, or an existing vehicle is used, the incremental distribution costs should be reduced

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