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sigma

Indexing resilience:

指数弹性:

a primer for insurance markets and economies

保险市场和经济的入门

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Executive summary
行政摘要

By closing existing protection gaps, insurers can strengthen global financial resilience by more than USD 1 trillion annually.
通过缩小现有的保护差距，保险公司可以每年增强超过 1 万亿美元的全球金融复原力。

In closing protection gaps, insurance boosts the resilience of entire economies.
在缩小保护差距方面，保险提高了整个经济体的弹性。

The advanced economies have become less and the emerging ones more resilient, according to our macro indices, which go well beyond traditional GDP metrics.
根据我们的宏观经济指数，发达经济体的规模变小了，新兴经济体的弹性增强了，这些指数远远超过了传统的 GDP 指标。

Our insurance indices, meanwhile, show notable gains in property resilience in advanced markets, and mortality protection in emerging economies.
与此同时，我们的保险指数显示，发达市场的房地产弹性和新兴经济体的死亡率保护显著增强。

A new record-high protection gap of USD 1.2 trillion for the three risk areas is a huge opportunity for insurers to build resilience.
三个风险领域 1.2 万亿美元的新纪录保护缺口对保险公司来说是建立复原力的巨大机遇。

The world economy has become less resilient but the insurance industry is keeping pace with changes in the risk landscape. Our jointly-developed Swiss Re Institute (SRI)-London School of Economics (LSE) Macroeconomic Resilience Index (E-RI), which is composed of a broad spectrum of variables to provide a more holistic assessment of economic health than gross domestic product (GDP) alone, shows that the global economy has less capacity to absorb the impact of a shock than it did 10 years ago. Meanwhile, our separately developed SRI Insurance Resilience Indices, based on measures of protection needed relative to that available, show a huge opportunity for insurers to close a combined record protection gap of

世界经济已变得不那么有弹性，但保险业正在跟上风险前景的变化。我们联合开发的瑞士再保险研究所(SRI)-伦敦政治经济学院(LSE)宏观经济韧性指数(E-RI)由广泛的变量组成，比国内生产总值(GDP)更全面地评估经济健康状况，这表明全球经济吸收冲击影响的能力不如 10 年前。与此同时，我们独立开发的 SRI 保险韧性指数(SRIInsuranceResilienceindex)——基于相对于现有保险所需的保护措施——显示出保险公司弥合创纪录的保护缺口的巨大机遇

USD 1.2 trillion in 2018 premium equivalent terms, in three main areas of risk: natural catastrophe, mortality and healthcare. We estimate that closing this protection gap would improve global financial resilience by more than USD 1 trillion each year.

2018 年，以保险费相当于 1.2 万亿美元计算，主要涉及三个风险领域:自然灾害、死亡率和医疗保健。我们估计，缩小这一保护差距将使全球金融复原力每年提高 1 万亿美元以上。

Among the advanced markets, the main drivers of declining economic resilience have been a lack of structural reforms, exhaustion of monetary policy options and a challenging environment for banks. The US is more resilient than the euro area, while the Swiss and Canadian economies consistently rank among the top 3 most resilient. Importantly, resilience is a global responsibility: a high E-RI score does not mean a country can withstand any type of shock by itself, come what may. Encouragingly, the aggregate E-RI indicates that emerging economies have become slightly more resilient, and we expect higher-quality growth to continue this trend. Globally, more focus on environmental and societal sustainability would benefit resilience.

在发达市场中，经济弹性下降的主要驱动因素是缺乏结构性改革、货币政策选择枯竭以及银行面临的挑战性环境。美国比欧元区更具弹性，而瑞士和加拿大的经济则一直位列最具弹性的前三位。重要的是，韧性是一项全球责任:高的 E-RI 分数并不意味着一个国家能够独自承受任何形式的冲击，不管发生什么情况。令人鼓舞的是，E-RI 总体数据表明，新兴经济体的弹性略有增强，我们预计，更高质量的增长将继续这一趋势。在全球范围内，更多地关注环境和社会可持续性将有利于复原力。

Separate to the E-RI, the SRI Insurance Resilience Indices (I-IRs) assess the positive contribution of insurance in helping households to better withstand shock scenarios. The I-RIs indicate that in relative terms, the insurance industry has kept pace with growing loss potential. In both the advanced and emerging markets, the composite I-RIs have improved since the turn of the century. The strongest increases have been in advanced economy property resilience and emerging market mortality protection. Notable also is the progress made in closing the health protection gap in Asia Pacific. Comparing the risk areas, the I-RIs for healthcare are higher than the others across all regions, a reflection of government and mandatory private insurance spending in this area, and because our index measures the funding gap only, not the treatment gap (our methodology is detailed in respective sections).

除 E-RI 外，社会责任投资保险抗逆能力指数(I-IRs)亦评估保险在协助住户抵御冲击方面的正面作用。I-ris 表明，相对而言，保险业已经跟上了日益增长的损失潜力。自世纪之交以来，无论是在发达市场还是在新兴市场，复合 I-RIs 都有所改善。增幅最大的是发达经济体的房地产弹性和新兴市场的死亡率保护。同样值得注意的是，在缩小亚太地区的健康保护差距方面取得了进展。比较风险范围，各地区医疗服务的资讯科技指数均较其他地区为高，反映政府及强制性私人保险在这方面的开支，以及因为我们的指数只量度资金缺口，而非治疗缺口(我们的方法在有关章节有详细说明)。

Our research also indicates that in absolute terms, the protection gap for the three

我们的研究还表明，就绝对值而言，三者的保护差距

risk areas combined more than doubled from 2000 to a new record high of

从 2000 年到 2010 年，风险地区总和增加了一倍以上，达到历史新高

USD 1.2 trillion in 2018. That is equivalent to a quarter of all premiums written by

2018 年 1.2 万亿美元。这相当于年全部保险费的四分之一

the global insurance industry in a single year and represents a large opportunity for

全球保险业在一个单一的一年，并代表了一个巨大的机会

the industry to further build resilience. We estimate that closing this protection gap

我们估计，要缩小这个保护差距

would improve global financial resilience by more than USD 1 trillion each year in the

在 2010 年，全球金融复原力将每年提高 1 万亿美元以上

form of average insurance claims pay-outs for covered events. In order to realise this

投保事件的平均保险索赔赔偿。为了实现这一点

potential, governments, regulators, insurers and businesses need to work together

潜力、政府、监管机构、保险公司和企业需要合作

to overcome the different supply- and demand-side barriers that hold back greater

克服阻碍经济增长的供需两方面的障碍

uptake of insurance. As an aside, for insurers, closing the protection gap makes good

保险理赔。顺便说一句，对保险公司来说，缩小保护差距是件好事

commercial sense too, generating what we estimate to be additional industry profit
商业意义也，产生什么，我们估计是额外的行业利润
potential of USD 60–80 billion each year.
每年 600-800 亿美元的潜力。

Our analysis is holistic, demonstrating also that insurance strengthens the overall resilience of an economy. Economies with higher levels of insurance penetration tend to exhibit less volatile growth. Further, we model the response of GDP growth to major natural catastrophes and find that risk transfer to insurance markets boosts stronger recoveries post disaster, thereby increasing the resilience of entire economies. We also assess the sector growth potential presented by emerging risk pools in commercial insurance like cyber, intangible corporate asset and business disruption risks, and how this would further contribute to global economic resilience.
我们的分析是整体的，也表明保险加强了一个经济体的整体弹性。保险渗透率较高的经济体的增长波动较小。此外，我们建立了 GDP 增长对重大自然灾害的反应模型，发现向保险市场的风险转移可以促进灾后更强劲的复苏，从而提高整个经济体的复原力。我们还评估了商业保险领域新出现的风险池(如网络、无形企业资产和商业扰乱风险)带来的行业增长潜力，以及这将如何进一步促进全球经济复原力。

What is resilience?

什么是韧性？

The world faces a growing number of complex and interconnected risks, including slowing global growth, ballooning government debt, negative interest rates, rising political risk, inequality, catastrophe losses, and climate and technological change, among others. In this environment, it is important to understand the ability of countries and households to cope with shock events. Our newly-constructed resilience indices serve this purpose.

世界面临着越来越多复杂且相互关联的风险，包括全球增长放缓、政府债务膨胀、负利率、政治风险上升、不平等、灾难性损失、气候和技术变化等等。在这种环境下，了解国家和家庭应对冲击事件的能力非常重要。我们新构建的韧性指数就是为了达到这个目的。

From a loss perspective, natural catastrophes are the main threats to global resilience.

从损失的角度来看，自然灾害是对全球复原力的主要威胁。

What have been perceived as the main sources of risk facing the world has evolved since the turn of the century. For instance, in its inaugural *Global Risks Report* in 2006, the World Economic Forum (WEF) listed a few high-impact headline risks like terrorism and pandemics as the biggest threats to society. In 2008–09,

被认为是世界面临的主要风险来源的情况自世纪之交以来已经发生了变化。例如，世界经济论坛(WEF)在其 2006 年的首份《全球风险报告》(GlobalRisksReport)中，将恐怖主义和大流行病等几个影响深远的头条风险列为对社会的最大威胁。在二○○八至○九年度，

the global financial crisis tuned awareness also onto economic and cross-border interconnectedness risks. And since 2017, environmental and technological risks have been included in the WEF's list of top 5 global risks. Another perspective is provided by the Cambridge Global Risk Index, which indicates that roughly a third of expected global losses from shock events come from natural catastrophes, and about a quarter are due to economic and financial market exposures.[1]

全球金融危机也让人们意识到了经济和跨境相互关联的风险。自 2017 年以来，环境和技术风险已被世界经济论坛列为全球 5 大风险之一。剑桥全球风险指数提供了另一种观点，该指数表明，全球冲击事件造成的预期损失中，约有三分之一来自自然灾害，约有四分之一来自经济和金融市场风险敞口

Resilience: it's macro- and micro-level

韧性:它是宏观和微观层面的

Resilience is the ability to minimise losses resulting from different risk events.

韧性是将不同风险事件造成的损失最小化的能力。

We define resilience as the capacity of an economy or society to minimise income and asset losses resulting from shock events. Some events are big enough to create macroeconomic impact and to this end, societal resilience depends on the ability of the entire economy to cope with shocks. We refer to this as "macro" resilience. In insurance, the term resilience is broadly used in the context of natural disasters, terrorism and cyber threats among others, as major challenges to society. In this *sigma*, we coin the term "micro resilience" to represent the vulnerability and ability of individuals, households and businesses to withstand shock events.

我们将韧性定义为一个经济体或社会将冲击事件造成的收入和资产损失降至最低的能力。有些事件大到足以产生宏观经济影响，为此，社会复原力取决于整个经济应对冲击的能力。我们称之为"宏观"弹性。在保险业，复原力一词被广泛用于自然灾害、恐怖主义和网络威胁等社会主要挑战的背景下。在这个标准差中，我们创造了"微弹性"这个术语来表示个人、家庭和企业抵御冲击事件的脆弱性和能力。

Our concepts of macro- and micro resilience tally with the UN's 17 Sustainable Development Goals.

我们的宏观和微观复原力概念符合联合国的 17 项可持续发展目标。

Insurance is a central component of building resilience at the macro- and micro levels. This is acknowledged in the United Nations (UN) Sustainable Development Goals

(SDGs), which include insurance as a main tool to strengthen the resilience of societies. The 2030 Agenda for Sustainable Development makes explicit references to and includes numerous targets that capture various aspects of resilience.[2] Disaster risk reduction, in particular, is central to several SDGs. Others illustrate the role of insurance in achieving development goals such as inclusive and sustainable economic growth, social protection, food security, agricultural, rural and urban development, gender equality and women's economic empowerment, as well as micro-, small- and medium-enterprise development.

保险是在宏观和微观层面建设复原力的核心组成部分。联合国(UN)可持续发展目标(SDGs)确认了这一点，其中包括将保险作为加强社会复原力的主要工具。2030 年可持续发展议程明确提到并列入了许多涉及复原力各个方面的目标。2 减少灾害风险尤其是若干可持续发展目标的核心。还有一些说明了保险在实现包容性和可持续经济增长、社会保护、粮食安全、农业、农村和城市发展、性别平等和增强妇女经济权能以及微型和中小型企业发展等发展目标方面的作用。

1 *Global Risk Index 2019 Executive Summary,* Cambridge Centre for Risk Studies, University of Cambridge, 2018.

2019 年全球风险指数报告摘要，剑桥风险研究中心，剑桥大学，2018。

2 *Transforming Our World: The 2030 Agenda for Sustainable Development*, United Nations, 2015.

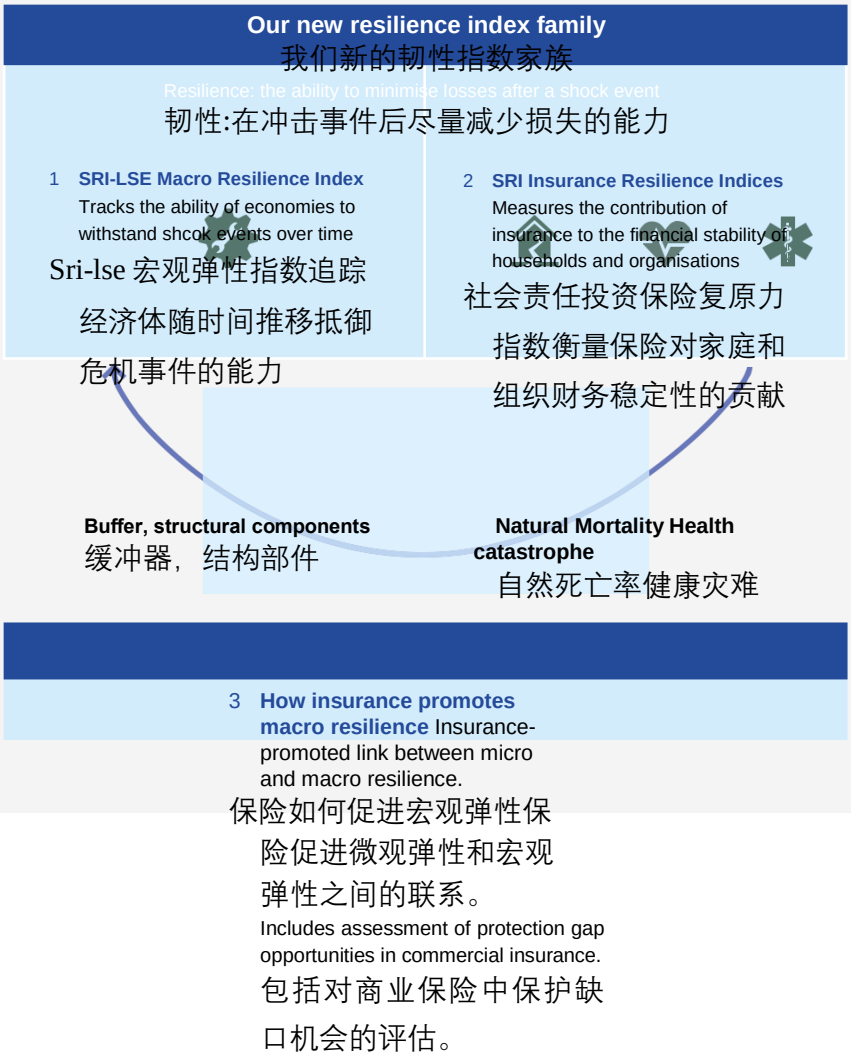
，联合国，2015 年。

We develop indices to measure the contribution of insurance to socio-economic well-being.
我们制定指数来衡量保险对社会经济福祉的贡献。

Scope of this *sigma*
本标准差的适用范围

This *sigma* quantifies the concept of resilience from both the macro- and micro perspectives in index format. We introduce the Swiss Re Institute (SRI)-London School of Economics (LSE) Macroeconomic Resilience Index, which measures and tracks economic resilience over time. The macro-resilience "scores" capture countries' fiscal and monetary policy flexibility and capability, and also reflect their structural socio-economic frameworks. Second, we present SRI Insurance Resilience Indices, which measure the relevance and contribution of insurance to the financial stability of individuals and households in three main areas of risk and protection gap. Specifically, the indices estimate the contribution of insurance in covering losses after a natural catastrophe, the income replacement needs in case of the premature death of a household's main earner, and the share of healthcare expenditure that causes financial stress. Figure 1 presents the narrative development of this *sigma* in the next chapters.
这个标准差以索引格式从宏观和微观的角度量化了韧性的概念。我们引入了瑞士再保险研究所(SRI)-伦敦政治经济学院(LSE)宏观经济弹性指数，该指数衡量并跟踪经济弹性随时间的变化。宏观复原力"得分"反映了各国财政和货币政策的灵活性和能力，也反映了其结构性社会经济框架。其次，我们提出了 SRI 保险复原力指数(SRIInsuranceResilienceindex)，该指数衡量了保险对风险和保护差距三个主要领域的个人和家庭金融稳定的相关性和贡献。具体而言，这些指数估计了自然灾害后保险对弥补损失的贡献、家庭主要收入来源过早死亡时的收入替代需求，以及导致财政压力的医疗支出份额。图 1 在接下来的章节中展示了这个 sigma 的叙述发展。

Figure 1
图 1
Conceptual framework of this *sigma*
这个 sigma 的概念框架



尚未开发的弹性机会:1 万亿美元

4 Capturing the full potential of insurance
4.发挥保险的全部潜力

Source: Swiss Re Institute
资料来源:瑞士再保险协会

Measuring macroeconomic resilience

衡量宏观经济的弹性

Our newly-developed SRI-LSE Macroeconomic Resilience Index shows that the global economy is less resilient today than in 2007. Lower buffers such as monetary policy being stretched to and beyond limits, and weaker structural factors (eg, a still challenging environment for banks), are the main drivers of lower resilience. On a positive note, the G4[3] economies have space for fiscal policy action. Among advanced economies, the US is more resilient than the euro area. The Swiss and Canadian economies consistently rank among the Top 3 most resilient. Emerging market resilience has improved slightly and can be increased further by the transition from "quantity" to "quality" economic growth. Environmental and societal sustainability are key to macro resilience for all countries.

我们新编制的 SRI-LSE 宏观经济复原力指数显示，全球经济今天的复原力不如 2007 年。较低的缓冲，如货币政策被拉伸到或超过极限，以及较弱的结构性因素(例如，对银行来说仍然具有挑战性的环境)，是较低的弹性的主要驱动力。从积极的方面来看，G43 经济体有采取财政政策行动的空间。在发达经济体中，美国比欧元区更具弹性。瑞士和加拿大的经济一直位列最具弹性的前三位。新兴市场的抵御能力略有提高，并可通过从"数量"经济增长向"质量"经济增长过渡而进一步提高。环境和社会可持续性是所有国家宏观复原力的关键。

The inability of a country to absorb shocks can have deep economic consequences.

一个国家无力承受冲击可能产生深刻的经济后果。

The current slowdown in many economies raises questions about the ability of countries to absorb future shocks. A low level of macroeconomic resilience can lead to devastating consequences as demonstrated, for instance, by recent experience in Greece. The economy there lacked the necessary shock absorbing buffers and adjustment mechanisms to deal with the global financial crisis (GFC) that started in 2008 and then the subsequent euro area sovereign debt crises in 2012. As a result, the Greek economy went through a deeper downturn than the Great Depression of the 1930s in the US.[4] Today, Greek society is still living with the repercussions and recovering from the shock, even with the strong progress that has since been made.

许多经济体目前的放缓使人们对各国是否有能力承受未来的冲击提出了疑问。宏观经济弹性水平低可能导致灾难性后果，例如，希腊最近的经历就证明了这一点。那里的经济缺乏必要的冲击缓冲和调整机制，无法应对始于 2008 年的全球金融危机以及随后于 2012 年发生的欧元区主权债务危机。其结果是，希腊经济经历了比上世纪 30 年代美国大萧条(GreatDepression)更为严重的衰退。今天，希腊社会仍然生活在经济危机的影响之中，正在从危机中复苏，尽管此后取得了强劲的进展。

Together with the LSE, we have built an innovative index to gauge a country's economic shock absorption capacity.

与伦敦证交所一起，我们建立了一个创新的指数，以衡量一个国家的经济减震能力。

The index also takes societal challenges into consideration.

该指数还将社会挑战纳入考虑。

The higher the shock absorption capacity, the more resilient an economy is.

减震能力越高，一个经济体的弹性就越大。

The SRI-LSE Macroeconomic Resilience Index

Sri-lse 宏观经济弹性指数

In the context of current global trends and country-specific developments, it is important to have a thorough understanding of the elements that make an economy more resilient. To this end, we present the jointly constructed SRI-LSE Macroeconomic Resilience Index (E-RI).[5] The index allows comparison of resilience levels across national economies and time, with our model generating E-RI "scores".

在当前全球趋势和具体国家发展的背景下，必须透彻了解使经济更具复原力的因素。为此，我们提出了共同构建的 SRI-LSE 宏观经济复原力指数(E-RI)。5 该指数允许对各国经济和时间的复原力水平进行比较，并使用我们的模型生成 E-RI"得分"。

We define macroeconomic resilience as an economy's ability to absorb shocks. The higher the shock absorption capacity (score), the more resilient an economy is. In constructing our E-RI, we consider several dimensions. First, we propose new ways to measure the buffer capacity of traditional policy instruments such as fiscal and monetary policy. Second, and as a lesson from the GFC, we put financial indicators at the centre of macroeconomic stability.

我们将宏观经济弹性定义为一个经济体吸收冲击的能力。减震能力(得分)越高，一个经济体的弹性就越大。在构造我们的 E-RI 时，我们考虑了几个维度。首先，我们提出了衡量传统政策工具(如财政和货币政策)缓冲能力的新方法。其次，作为全球金融中心的经验教训，我们将金融指标置于宏观经济稳定的中心。

Third, we go beyond traditional economic dimensions by including links to societal challenges in individual countries such as inequality and climate change to explain how these add, if at all, to an economy's resilience.[6] We measure societal inequality indirectly. For example, in the assessment of labour market efficiency, we consider inequality measures such as the female participation ratio in the labour force, and the gender pay gap. We also take human capital into account as a measure of social mobility.[7]

第三，我们超越了传统的经济层面，将不平等和气候变化等个别国家面临的社会挑战联系起来，解释这些因素如何增加(如果有的话)一个经济体的复原力。6.我们间接地衡量社会不平等。例如，在评估劳动力市场效率时，我们考虑了诸如女性劳动力参与率和性别薪酬差距等不平等措施。我们还将人力资本作为衡量社会流动性的一个指标

3 G4 = the US, China, Japan and Germany.

G4 包括美国、中国、日本和德国。

4 M. King, "Europe Must Learn From the Greek Tragedy", *bloomberg.com*, 11 July 2019.

M.King，"EuropeMustLearnFromtheGreekTragedy"，2019 年 7 月 11 日。

5 LSE is the London School of Economics and Political Sciences. In particular, Swiss Re Institute thanks Simeon Djankov from the LSE for his contribution to the E-RI under the strategic SRI-LSE Resilience Research initiative.

伦敦政治经济学院是伦敦政治经济学院。特别是，瑞士再保险协会感谢伦敦经济学院的 SimeonDjankov，感谢他在战略性的 sri-LSE 韧性下为 E-RI 做出的贡献研究计划。

6 *Climate change: a core financial stability risk,* The Institute of International Finance (IIF), 2019.

《气候变化:金融稳定的核心风险》，国际金融研究所，2019 年。

7 We omit the Gini ratio because of (1) data constraints; and (2) as inequality goes beyond income inequalities.

我们忽略基尼系数是因为(1)数据限制;(2)因为不平等超越了收入不平等。

Methodology
方法论

Our index includes a sample of 31 countries that make up about 75% of world GDP.
我们的指数包括了 31 个国家的样本，这些国家占世界 GDP 的 75%。

To construct the E-RI, we use annual data from 2007 to 2018 for 31 advanced and emerging economies. The countries in our sample are of systemic importance to the world economy, together making up roughly 75% of global GDP. Importantly, these countries have complete, robust and reliable data series. The lack of data is the main reason for exclusion of other larger economies (eg, such as Argentina and Indonesia).
为了构建 E-RI，我们使用了 31 个发达和新兴经济体从 2007 年到 2018 年的年度数据。我们样本中的国家对世界经济具有系统性的重要性，总共约占全球 GDP 的 75%。重要的是，这些国家拥有完整、健全和可靠的数据系列。缺乏数据是其他较大经济体(如阿根廷和印度尼西亚)被排除在外的主要原因。

The index consists of macro buffers and structural elements.
该指数由宏缓冲区和结构元素组成。

Table 1 below outlines the nine components that constitute the E-RI, and the rationale for their inclusion.[8] The E-RI comprises two overarching dimensions: buffers and structural components.
下文表 1 概述了构成 E-RI 的九个组成部分，以及列入这些组成部分的理由。

- **Macro buffer** components include an economy's room to use monetary and fiscal policy. Broadly speaking, fiscal space measures how likely a country is to face fiscal distress, that is a time of extreme funding difficulty/loss of market access. The less likely a country is to face fiscal distress, the more fiscal space it has. The monetary policy space component measures the ability to ease or tighten policy. Among others, this includes the distance of short and long-term interest rates to the zero lower bound. This de facto captures the ability and effectiveness of interest rate cuts and quantitative easing.[9]

宏观缓冲部分包括一个经济体使用货币和财政政策的空间。一般而言，财政空间衡量的是一个国家面临财政困境的可能性有多大，这是一个资金极度困难/丧失市场准入的时期。一个国家面临财政困境的可能性越小，它拥有的财政空间就越大。货币政策空间部分衡量的是放松或收紧政策的能力。其中包括短期和长期利率到零下限的距离。这实际上反映了降息和定量宽松的能力和效果。9

Each component of the index is scored from 0 (minimal resilience) to 1 (maximum).
指数的每个组成部分从 0(最小弹性)到 1(最大值)进行评分。

- **Structural** components are variables that define the fundamental framework of an economy and which evolve/develop slowly, such as access to talent and the challenges that banks face in a prevailing operating environment. To a large extent, a country's economic structure defines how dynamic a society's shock absorbing mechanisms are. All structural indicators are indices themselves, or components of other already-available indices.[10]

结构组成部分是界定经济基本框架的变量，它们演变/发展缓慢，例如获得人才的机会以及银行在当前经营环境中面临的挑战。在很大程度上，一个国家的经济结构决定了一个社会吸收冲击机制的动态程度。所有结构指标本身都是指数，或其他已有指数的组成部分

All component indicators have scores ranging between zero and one[11] and are weighted according to the weights in Table 1. One represents the highest score across time and sample countries, and zero is the lowest. A value of one means that a country is the most resilient in that particular category and year, while a value of zero infers minimal resilience. By averaging the scores of each of the nine components, we derive overall E-RI scores of each of our sample countries and regions, between 2007 and 2018 (see appendix for details).

所有组成指标的得分在 0 到 1 之间，并根据表 1 中的权重进行加权。1 代表时间和样本国家的最高分，0 代表最低分。数值为 1 意味着一个国家在这一特定类别和年份中是最有弹性的，而数值为零则意味着弹性最小。通过对九个组成部分的分数进行平均，我们得出了 2007 年至 2018 年间我们每个抽样国家和地区的总体 E-RI 分数(详见附录)。

8 While very important for different analysis such as recession likelihood estimation, indicators of imbalances are disregarded, as our index focuses on the shock absorption capacity of economies.
尽管对于衰退可能性估计等不同分析非常重要，但失衡指标被忽略，因为我们的指数侧重于经济体的减震能力。

9 Given vastly different economic and policy environments, the approaches for advanced and emerging economies in our index are different. The standardization approach is also slightly different versus the rest of the variables. See appendix for more details.
鉴于经济和政策环境的巨大差异，发达国家和新兴国家的做法我们指数中的经济体不同。与其他变量相比，标准化方法也略有不同。详情请参阅附录。

10 Components that are indexes include the low-carbon economy index, for example. The soundness of banks is a component of the WEF's competitiveness index. More details are available in the appendix.
作为索引的组件包括低碳经济索引，例如。银行的稳健性是世界经济论坛竞争力指数的一个组成部分。详情请参阅附录。

11 The zero to one scores are created using a “min-max” approach. It is a technique that transforms data with different scales into values between zero to one.
0 到 1 的分数是使用“最小最大值”方法创建的。这是一种将不同尺度的数据转换成 0 到 1 之间的值的技术。

Measuring macroeconomic resilience
衡量宏观经济的弹性

Table 1
表一
The components of the SRI–LSE Macroeconomic Resilience Index
Sri-LSE 宏观经济复原力指数的组成部分

Indicator	Weight	Source	Definition of indicator 指标的定义	Rationale
Macro buffers 宏缓冲区				
Fiscal space	35%	Swiss Re, based on data from World Bank(WB)/IMF	An empirical estimate of a country's fiscal leeway. This includes the level of government debt as a percent of GDP, the sovereign debt rating, real GDP growth, the current account and primary balance, and a measure of FX pressure on the real economy.[12] For emerging markets, we include FX reserves in terms of months of imports.	We consider fiscal policy to be the most important policy tool to mitigate the length and 我们认为财政政策是最重要的政策工具，以减轻长度和 depth of an economic shock. 经济冲击的深度。
Monetary policy space	15%	Swiss Re, based on WB data	Measures the ability of a central bank to ease or tighten monetary policy. This includes the distance of short and long-term rates to the zero lower bound or to "fair-value" yield estimates. For emerging markets, a proxy of central bank independence and the policy differential against the US Federal Reserve are also included.	Monetary policy is a key policy instrument to absorb economic shocks. 货币政策是吸收经济冲击的关键政策工具。
Macro structural elements 宏观结构要素				
Banking industry backdrop	18%	WEF	The findings of a WEF survey of executives, indicating how sound a country's banks are generally considered to be. The measure is not based on economic or accounting measures, but popular perceptions around dimensions influencing the health of the banking sector (eg, capital buffers, sustainability of business models, regulatory developments and the macro environment[13]).	A fragile banking industry backdrop propagates shocks given the sector's 脆弱的银行业背景给银行业带来了冲击 interconnectedness with the economy. 与经济的联系。
Labour market efficiency	12%	WEF	Includes flexibility of wage determination, hiring and firing practices, capacity to retain talent, female participation in the labour force, etc.	More efficient and dynamic labour markets allow for easier reallocation of workers during times of stress.
Financial market development	10%	IMF	This component is a summary of how developed financial markets are in terms of depth, access and efficiency.	Developed financial markets diversify the funding sources available for the real economy.
Economic complexity	4%	The Observatory of Economic Complexity	A holistic measure of the sophistication and variety of goods produced by and exported from an economy. It shows the breadth and depth of an economy's production capacity.	An economy producing sophisticated and a variety of goods will be less affected by shocks in specific sectors.
Insurance penetration	2%	Swiss Re	Ratio of total (life and non-life) direct insurance premiums to GDP.	Insurance acts as a shock absorber and smoothens financial volatility.
Human capital	2%	WB	Assesses how health and education levels shape the productivity and social mobility.	High social mobility and skill levels make a country more dynamic, such that it can better withstand and adjust to shocks.
Low-carbon economy	2%	Maplecroft	Measures the extent to which a country already is a low-carbon economy (low fossil fuel or de-carbonized in terms of output/emissions).	Climate change has disruptive effects on global supply chains and infrastructure. This negatively impacts government finances, firms' capital, and household wealth.[14]

Notes (1) For more on weights and empirical relevance of the index, see appendix. Robustness tests showed that changing the weights slightly does not meaningfully
附注(1)有关索引的权重和经验相关性的更多信息，请参见附录。健壮性测试表明，稍微改变权重没有意义
alter country rankings; (2) The fiscal space does not include market prices such as Credit Default Swaps, because prices are not available for all countries, and they do not
(2)财政空间不包括信用违约互换(cds)等市场价格，因为不是所有国家都能获得价格，也不是所有国家都能获得
allow for a further fundamental macro analysis of what increases a fiscal distress likelihood. (3) Insurance penetration has a low weight since its value proposition of
允许进一步进行基本面宏观分析，看看是什么增加了财政困境的可能性。(3)保险普及率自 2009 年价值主张以来一直较低
financial volatility smoothing occurs mostly at the "micro" level (for households and corporates). Source: LSE, Swiss Re Institute
金融波动平滑主要发生在"微观"层面(家庭和企业)。资料来源:伦敦政治经济学院，瑞士再保险学院

12 The measure of FX pressure relates the PPP-implied exchange rate to the nominal exchange rate against the US dollar. An overvalued currency implies an economy is less competitive, which increases the fiscal default probability. We include FX pressure in the fiscal space indicator instead of the monetary policy space measure. This is because the euro area sovereign debt crisis showed that a country's inability to devalue quickly has severe repercussions for its fiscal position. In a currency union like the euro area, overvaluation can only be restored by devaluing the real economy, for example by lowering wages and prices, which is very costly in terms of GDP and employment levels. In any case, large economies with a free-floating exchange rate can also experience severe fiscal distress and adjustment, as was the case in the UK in 1976.

外汇压力的衡量将购买力平价隐含汇率与对美元的名义汇率联系起来。被高估的货币意味着一个经济体缺乏竞争力，这增加了财政违约的可能性。我们将外汇压力纳入财政空间指标，而非货币政策空间指标。这是因为欧元区主权债务危机表明，一个国家无力迅速贬值会对其财政状况产生严重影响。在欧元区这样的货币联盟中，只有通过降低实体经济的价值，例如通过降低工资和物价，才能恢复过高的估值，而降低工资和物价对 GDP 和就业水平来说是非常昂贵的。无论如何，实行自由浮动汇率的大型经济体也可能遭遇严重的财政困境和调整，1976 年英国就是这种情况。

13 Regulatory filings such as banks' capital positions are not available for all countries and for a sufficient amount of time.

并非所有国家都能在足够长的时间内获得银行资本状况等监管备案文件。

14 *Climate change: a core financial stability risk,* IIF, 2019.

气候变化:金融稳定的核心风险，IIF，2019。

Global macro resilience today is lower than in 2007
今天的全球宏观弹性低于 2007 年

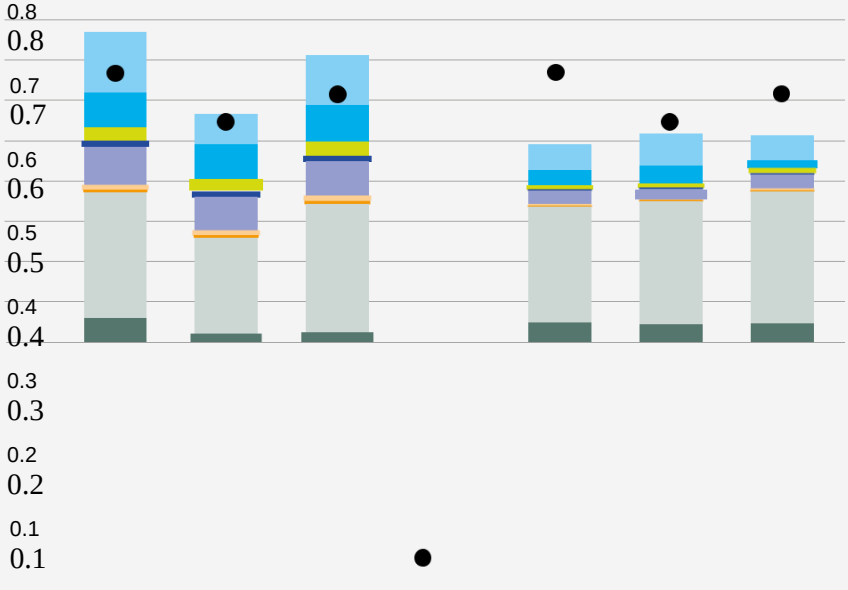
The global economy has become less resilient since 2007.
自 2007 年以来，全球经济的弹性越来越小。

Given the large share of global output that they represent (75%), the macro resilience scores of our 31 sample countries indicate that the world economy is less resilient today than it was a decade ago. Eighty percent of the countries in our sample had lower resilience scores for 2018 than for 2007, and 30% were significantly less resilient.[15] The main drivers of this trend have been the exhaustion of monetary policy options in many advanced countries and an ongoing challenging operating environment for the banking sector, even as policy efforts have strengthened financial institutions since the GFC. Other indicators such as financial market development, the efficiency of labour markets and social mobility also deteriorated by roughly 10 percentage points (ppt) between 2007 and 2018. Meanwhile, fiscal space has increased marginally, the improvement largely emerging-market driven.
考虑到这些国家在全球产出中所占的很大份额(75%)，我们 31 个抽样国家的宏观弹性得分表明，当今世界经济的弹性比十年前要小。[15] 这一趋势的主要驱动因素是，许多发达国家的货币政策选择已经枯竭，银行部门的经营环境仍然面临挑战，尽管自全球金融委员会以来，政策努力加强了金融机构。金融市场发展、劳动力市场效率和社会流动性等其他指标在 2007 年至 2018 年期间也恶化了大约 10 个百分点。与此同时，财政空间略有增加，这种改善主要是由新兴市场推动的。

Changes in prevailing economic circumstances are behind fluctuating levels of resilience.
主要经济环境的变化是弹性水平波动的原因。

Figure 2 shows the changes in the composition of aggregate E-RIs in the advanced and emerging markets for our sample countries in 2007, 2013 and 2018. The changes reflect prevailing circumstances at each point in time. For instance, the estimate of shrunken fiscal leeway in the advanced economies in 2013 relative to 2007 can in part be explained by the euro area sovereign debt crisis that was in full flow at that time.
图 2 显示了 2007 年、2013 年和 2018 年我们的样本国家在发达市场和新兴市场的 e 级综合指数构成的变化。这些变化反映了每个时间点的主要情况。例如，对发达经济体 2013 年相对于 2007 年财政回旋余地缩小的估计，可以部分地解释为欧元区主权债务危机在当时是全流动的。

Figure 2
图 2
Composition and levels of advanced and emerging markets' macro resilience indices over time
随着时间的推移，先进和新兴市场宏观弹性指数的构成和水平





Source: SRI-LSE Macroeconomic Resilience Index

资料来源:SRI-LSE 宏观经济复原力指数

15 For the 30%, resilience scores were at least 10 ppt lower than in 2007. The largest gains in resilience were made by Turkey. Starting from a very low base, Turkey was ranked lowest in the sample in 2007 compared to fifth lowest in 2018. The primary improvement factor was more fiscal space.

对于 30%的人来说，韧性得分至少比 2007 年低了 10 个百分点。复原力增长最大的国家是土耳其。从一个非常低的基数开始，土耳其在 2007 年的抽样中排名最低，而 2018 年排名第五。主要的改善因素是更多的财政空间。

Advanced economies have added buffer capacity since 2010.

自 2010 年以来，发达经济体增加了缓冲能力。

Advanced economies' resilience levels remain below 2007 levels, but in aggregate they have added some buffer capacity again since the low-point in 2010. This is primarily driven by increased fiscal space and signals of slowly improving confidence in the banking system. Importantly, financial markets have become less deep and less efficient since 2007.[16] Policy makers should further strengthen private capital markets, as market participants have flagged the risk of a liquidity-driven crisis.[17] Access to a more diverse source of funding is key for resilience. Further, higher insurance penetration rates can help reduce the impact on public finances and lower the need for private borrowing in case of an economic shock (see chapter *How insurance promotes macro resilience*).

发达经济体的弹性水平仍低于 2007 年的水平，但总体而言，自 2010 年的低点以来，它们又增加了一些缓冲能力。这主要是由于财政空间扩大，以及银行体系信心缓慢改善的迹象。16 决策者应进一步加强私人资本市场，因为市场参与者已表明存在流动性驱动的危机风险。此外，提高保险普及率有助于减少对公共财政的影响，并在经济冲击时降低私人借贷的需求(见保险如何促进宏观抵御能力一章)。

Emerging markets have become slightly more resilient, and we expect more "higher-quality" growth to continue this trend.

新兴市场已变得更具弹性，我们预计，更"高质量"的增长将继续这一趋势。

Emerging market economies generally have lower resilience scores than advanced economies. Encouragingly, however, emerging market resilience scores have improved slightly over time. To some extent, the slow dynamics reflect that the emerging markets were less affected by the GFC. Still, on an absolute level, emerging economies have seen their fiscal stances improve substantially. Looking ahead, the upside is that as more emerging markets transition from "quantity" to "quality" economic growth,[18] their macro resilience levels should naturally strengthen as well.

新兴市场经济体的弹性得分普遍低于发达经济体。不过，令人鼓舞的是，随着时间的推移，新兴市场弹性得分略有提高。在某种程度上，缓慢的动态反映出，新兴市场受全球金融中心的影响较小。不过，就绝对水平而言，新兴经济体的财政状况已大幅改善。展望未来，随着越来越多的新兴市场从"数量"经济增长向"质量"经济增长过渡，它们的宏观弹性水平自然也会增强。

Global macro resilience could be much lower absent effective global crisis coordination.

如果没有有效的全球危机协调，全球宏观抵御能力可能会低得多。

Importantly, while at the global level the differences between 2007 and today may seem small at face value, the backdrop for crisis response has also changed. Rising geopolitical stresses of recent years could have the effect of undermining effective policy coordination, for example at the G20 level. In the absence of global crisis coordination, actual resilience levels are likely to be lower than the E-RI scores for the world, advanced and emerging markets would suggest.

重要的是，虽然从表面上看，2007 年与今天之间的差距似乎很小，但应对危机的背景也发生了变化。近年来不断上升的地缘政治压力可能会破坏有效的政策协调，例如在 G20 层面。在缺乏全球危机协调的情况下，实际的复原力水平可能低于世界、先进和新兴市场的 E-RI 得分。

16 The IMF financial market development index shows that financial markets in the advanced economies have become less developed since 2007.

国际货币基金组织的金融市场发展指数显示，自 2007 年以来，发达经济体的金融市场变得不太发达。

17 *Ten Years After the Global Financial Crisis: A Changed World*, JP Morgan, 2018.

全球金融危机后的十年:一个改变了的世界，JP 摩根，2018。

18 Emerging market economic growth rates are likely to be lower in the future, but the GDP composition will continue to evolve. The share of manufacturing within GDP is expected to decline, while services will increase in importance. See *sigma* 1/2019: Emerging markets – the silver lining amid a challenging outlook, Swiss Re Institute.

新兴市场的经济增长率在未来可能会更低，但国内生产总值的构成将继续演变。制造业在 GDP 中所占的份额预计将下降，而服务业的重要性将增加。见 sigma1/2019:新兴市场——充满挑战的前景中的一线希望，瑞士再保险研究所。

Regional breakdown of macroeconomic resilience
宏观经济复原力的区域分析

North America is the most resilient region today due to strong fundamentals and buffers.
由于强劲的基本面和缓冲，北美是当今最具弹性的地区。

In large regional aggregates, divergent developments of various countries can cancel out and provide an undifferentiated picture. Here we take a more granular look at regional and country index levels.[19] According to our aggregate E-RIs, North America (meaning here the US and Canada) is the most resilient region today. Even though the US was the epicentre of the GFC, the US and Canada both have resilience levels well above the world average. This is due to strong economic fundamentals and buffers including efficient labour and open capital markets, and ample fiscal space. And, although low on an absolute level, there is more monetary policy space in the US and Canada than, for example, in the euro area.

在大的区域总量中，各国不同的发展可以相互抵消，提供一个无差别的图景。这里我们对地区和国家指数水平进行更细致的分析。19 根据我们的累计经济指数，北美(这里指的是美国和加拿大)是当今最具弹性的地区。尽管美国是全球金融中心的震中，但美国和加拿大的弹性水平都远高于世界平均水平。这要归功于强劲的经济基本面和缓冲，包括高效的劳动力和开放的资本市场，以及充足的财政空间。此外，尽管绝对水平较低，但美国和加拿大的货币政策空间比欧元区等国家更大。

Latin America's resilience levels have improved, but the structural picture remains challenging.
拉丁美洲的复原力水平有所提高，但结构性状况仍具有挑战性。

Broadly in line with the emerging market aggregate, Latin America's resilience levels have improved slightly since 2007 (see Figure 3). However, the structural picture remains challenging: capital markets are not sufficiently developed, and labour markets show low workforce productivity and high levels of job informality.[20] In addition, the human capital backdrop is fragile with 38% of the population vulnerable to falling (back) into poverty.[21] However, there are vast differences within the region. Chile is doing comparatively well due to sufficient fiscal space and a solid operating environment for banks. Mexico and Brazil, on the other hand, score lower than Chile on two thirds of the indicators.[22]

自 2007 年以来，拉丁美洲的弹性水平与新兴市场的总体水平基本一致(见图 3)。然而，结构状况仍然具有挑战性:资本市场不够发达，劳动力市场显示劳动生产率低，非正规就业水平高。此外，人力资本背景脆弱，38%的人口容易陷入贫困。由于拥有充足的财政空间和稳健的银行经营环境，智利的表现相对较好。另一方面，墨西哥和巴西在三分之二的指标上都低于智利。22

The resilience scores for Asia Pacific have been stable.
亚太地区的韧性得分一直保持稳定。

Encouragingly, Asia and Oceania had quite stable macro resilience scores through 2007–2018, while global resilience has weakened. China and Japan's resilience levels have remained roughly unchanged.[23] Meanwhile, India has become a little less economically resilient, mostly due to lower scores for the financial sector component of the E-RI.[24] That said, India has made laudable efforts to move towards a low-carbon economy, an investment in future resilience.

令人鼓舞的是，在 2007-2018 年期间，亚洲和大洋洲的宏观复原力得分相当稳定，而全球复原力有所减弱。与此同时，印度的经济弹性有所下降，主要是因为 e-ri4 中金融部门的分数较低。尽管如此，印度已经做出了值得称赞的努力，朝着低碳经济的方向发展，这是对未来弹性的投资。

Australia's continued economic success will depend heavily on especially ensuring fiscal space.
澳大利亚持续的经济增长成功在很大程度上取决于特别是确保财政空间。

A surprising result is Australia, which has been "recession-free"[25] for almost three decades, and where aggregate resilience has improved slightly since 2007. Even so, in E-IR terms, Australia ranks broadly in the middle of our country sample. The country's banking sector was stronger than in its advanced economy peers during the GFC, and Australia has also benefited from its proximity to and economic links with China.[26] However, it does not score well on index components such as a low-

carbon economy, economic complexity and labour market efficiency. Further, in our view, more fiscal space will be very important to safeguarding continued resilience.

令人惊讶的结果是，澳大利亚近 30 年来一直“没有出现衰退”，25 个国家的总体弹性自 2007 年以来略有提高。即便如此，在 E-IR 方面，澳大利亚在我国样本中仍处于中等水平。在全球金融危机期间，澳大利亚的银行业比其他发达经济体更强大，而且澳大利亚也得益于与中国的邻近和经济联系。然而，澳大利亚在低碳经济、经济复杂性和劳动力市场效率等指标方面表现不佳。此外，我们认为，增加财政空间对维持持续的抗震能力至为重要。

19 Our sample only includes one African country (South Africa) due to data limitations. Emerging economies in Europe and Asia are not broken out as separate categories.

由于数据的限制，我们的样本只包括一个非洲国家(南非)。欧洲和亚洲的新兴经济体并没有被划分为不同的类别。

20 *Recent experiences of formalization in Latin America and the Caribbean*, International Labour Organisation, 2014.

，国际劳工组织，2014 年。

21 *Will social mobility continue in Latin America?*, World Economic Forum, 2016.

，世界经济论坛，2016。

22 For a more detailed analysis of Latin America's economic and insurance market environment, please see *Latin America regional market report 2019,* Swiss Re Institute.

更详细地分析拉丁美洲的经济和保险市场环境，请参阅 2019 年拉丁美洲区域市场报告，瑞士再保险研究所。

23 Both countries are discussed in more detail further below.

下面将进一步详细讨论这两个国家。

24 Including soundness of banks, insurance penetration and financial market development.

包括银行的稳健、保险的渗透和金融市场的发展。

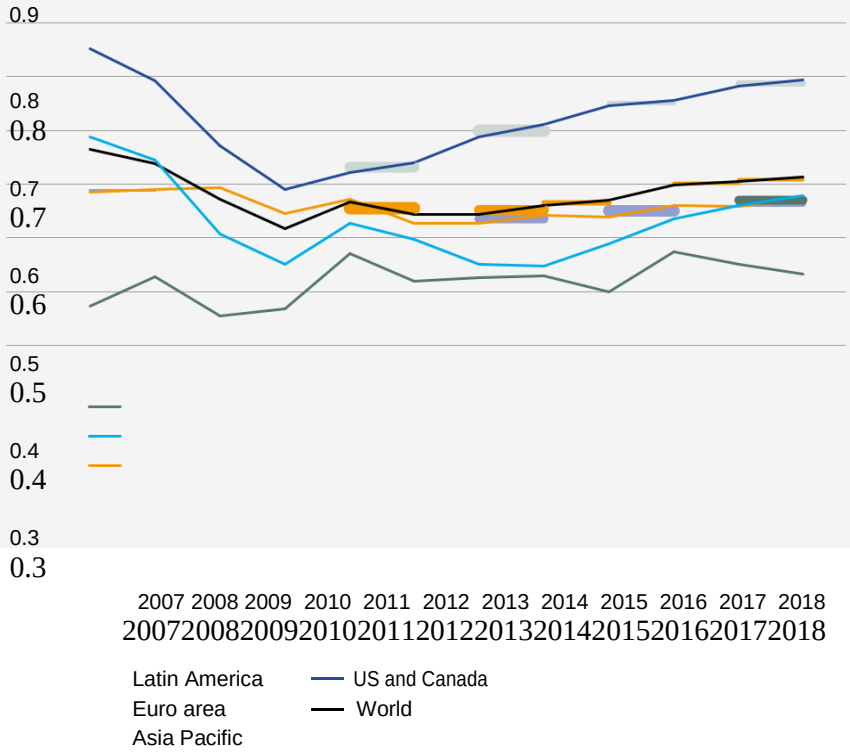
25 “Recession free” is defined as avoiding two consecutive quarters of negative growth rates.

“无衰退”的定义是避免连续两个季度的负增长率。

26 *Australia – 2018 Article IV Consultation*, IMF, 2018, and N. Irwin, “What the Rest of the World Can Learn From the Australian Economic Miracle”, *The New York Times,* 6 April 2019.

澳大利亚——2018 年第四条磋商，国际货币基金组织，2018 年，n.Irwin，”世界其他国家可以从澳大利亚经济奇迹中学到什么”，2019 年 4 月 6 日。

Figure 3
Absolute macro resilience levels across regions and time
跨越地域和时间



Source: SRI-LSE Macroeconomic Resilience Index
资料来源:SRI-LSE 宏观经济复原力指数

Resilience has weakened most in the euro area since 2007…
自 2007 年以来，欧元区大部分地区的弹性都有所下降.....。

Macroeconomic resilience in the euro area has decreased the most since 2007. Key contributors are (1) fragile fiscal positions in some countries; (2) exhaustion of monetary policy options; (3) endemic weaknesses in the banking system; (4) labour market inefficiency; and (5) underdeveloped financial markets. Exhausted monetary policy has key implications for fiscal space and other resilience categories. For example, although many countries in the euro area have more fiscal space now than in 2007 or 2012 due to fiscal consolidation, a substantial amount of this was facilitated by the European Central Bank (ECB).[27] Fiscal space is the ability to avoid extreme government funding difficulties. The ECB's policies of the past decade have prevented such severe funding conditions arising and when they did, they did not last very long. Should market stress resurface that the ECB cannot combat effectively, fiscal space in the euro area could be much more constrained than our current estimates suggest. In other words, while a decrease in monetary policy space has to some extent temporarily facilitated fiscal space, the euro area remains exposed to a negative shift in sentiment as buffers are thin. Furthermore, ultra-accommodative monetary policy has not contributed to more diversified funding sources of the real economy.[28] Meanwhile, the structural elements in our E-RI have weakened since 2007, suggesting that the euro area has not made sufficient progress in making the economy more dynamic since 2007.

欧元区的宏观经济复原力出现了 2007 年以来的最大降幅。主要原因有:(1)一些国家的财政状况脆弱;(2)货币政策选择已经用尽;(3)银行系统普遍存在的弱点;(4)劳动力市场效率低下;(5)发展不足的金融市场。耗尽的货币政策对财政空间和其他弹性类别具有关键影响。例如，由于财政整顿，欧元区许多国家现在的财政空间比 2007 年或 2012 年更大，但其中很大一部分是由欧洲中央银行促成的。欧洲央行过去 10 年的政策阻止了这种严峻的融资条件的出现，即使出现了，也没有持续很长时间。如果市场压力再次浮现，欧洲央行无法有效应对，欧元区的财政空间可能会比我们目前的估计所

显示的更为有限。换句话说，虽然货币政策空间的缩小在某种程度上暂时促进了财政空间，但由于缓冲区不足，欧元区仍面临着情绪的负面转变。此外，极度宽松的货币政策并没有促使实体经济的资金来源更为多元化。28 与此同时，自 2007 年以来，欧洲经济一体化指数中的结构性因素有所减弱，表明欧元区自 2007 年以来在提高经济活力方面没有取得足够的进展。

27 Ultra-accommodative monetary policy leads to a greater ability to run primary balance deficits, while it has also supported euro area growth. In our estimation, both factors increase fiscal space.

极度宽松的货币政策提高了运行基本平衡赤字的能力，同时也支持了欧元区的增长。据我们估计，这两个因素都增加了财政空间。

28 The monetary policy space indicator and the IMF's financial market development index have a positive correlation of almost 0.9 in the euro area, meaning that more monetary intervention was accompanied by less breadth and depth of financial markets in the region

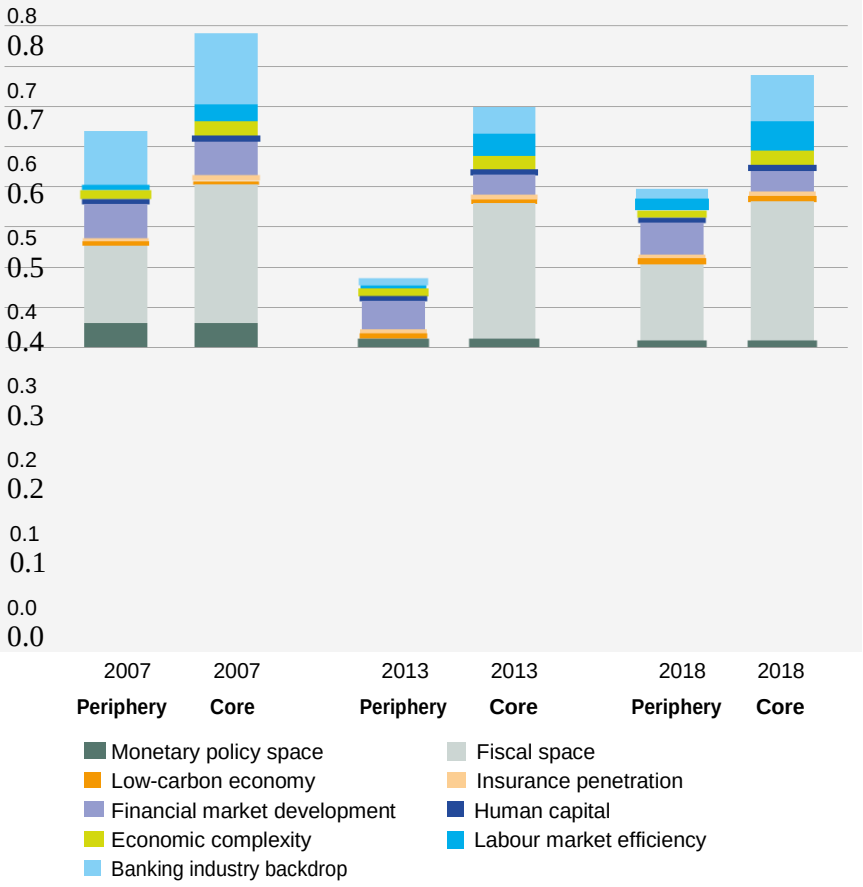
货币政策空间指标和国际货币基金组织的金融市场发展指数在欧元区的正相关性接近 0.9，这意味着更多的货币干预伴随着该区域金融市场的广度和深度的减少

Measuring macroeconomic resilience
衡量宏观经济的弹性

…although levels of resilience are nuanced across the region.
虽然整个地区的适应力水平有所不同。

Figure 4 shows that the peripheral countries are much less resilient than the core economies of the euro area.[29] The key contributors for lower resilience levels in peripheral countries are lower fiscal space and weaknesses in the banking sector. Greece and Italy have the lowest macro resilience levels and hence would gain most from strengthening their macro buffers and economic frameworks.
图 4 显示，与欧元区核心经济体相比，外围国家的抵御能力要差得多。29 外围国家抵御能力较低的主要原因是财政空间较小和银行部门薄弱。希腊和意大利的宏观弹性水平最低，因此从加强宏观缓冲和经济框架中获益最多。

Figure 4
图 4
Decomposition of E-RI between euro area core and peripheral countries, 2007, 2013 and 2018
2007 年、2013 年和 2018 年欧元区核心国家与外围国家之间 E-RI 的分解



Source: SRI-LSE Macroeconomic Resilience Index
资料来源:SRI-LSE 宏观经济复原力指数

Progressing with the European Capital Market Union to diversify funding sources is key.
与欧洲资本市场联盟共同推进融资渠道多元化是关键。

Given its weaker macroeconomic buffers, for the euro area to become more resilient, we believe progressing and finalizing the European Capital Market Union will be key. This would deepen financial markets and diversify the region's funding sources and take some pressure off monetary policy. Moving forward with bank consolidation and overhauling labour markets should also be top priorities, in our view.[30]
鉴于其较弱的宏观经济缓冲，为了使欧元区变得更具弹性，我们相信取得进展并最终确定欧洲资本市场联盟将是关键。这将深化金融市场，使该地区的资金来源多样化，并减轻货币政策的压力。我们认为，推进银行整合和劳动力市场改革也应成为当务之急

29 Peripheral countries include Italy, Portugal, Spain, Greece and Ireland. This definition is in line with the IMF, in *Macro-Financial Implications of Corporate (De)Leveraging in the Euro Area Periphery,* 2013. Core countries are Germany, France, Austria, The Netherlands and Belgium.

外围国家包括意大利、葡萄牙、西班牙、希腊和爱尔兰。这个定义是符合国际货币基金组织，在宏观金融影响的企业(去)杠杆在欧元区外围，2013 年。核心国家是德国、法国、奥地利、荷兰和比利时。

30 *Euro Area – IMF Staff concluding Statement of the 2019 Article IV Mission*, IMF, 2019.

欧元区-基金组织工作人员 2019 年第四条使命结论声明，基金组织，2019 年。

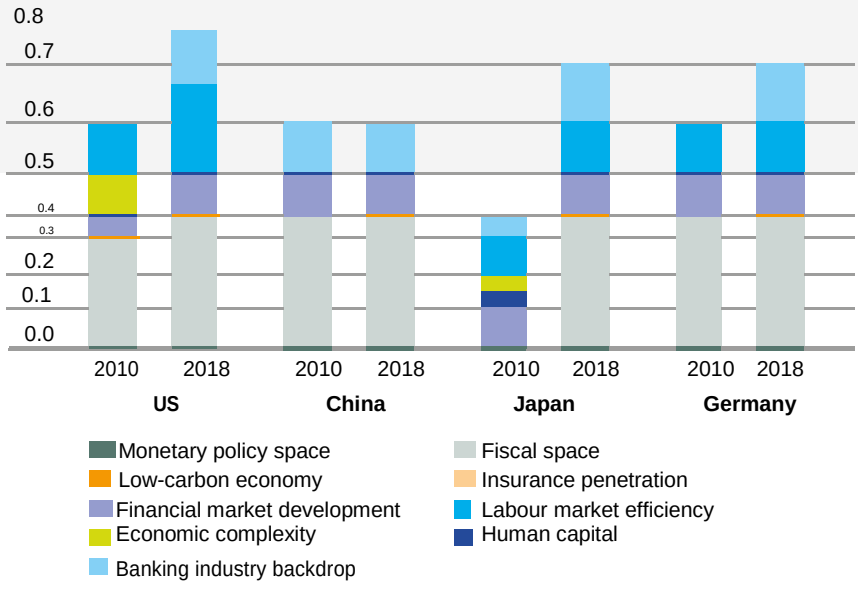
Strengthening the macroeconomic resilience of the "Big 4" will boost global shock absorbing capacity.
加强“四大”的宏观经济弹性将提高全球减震能力。

The “Big 4”: US, China, Japan and Germany
“四大”:美国、中国、日本和德国

The “Big 4” economic and insurance market heavyweights – the US, China, Japan and Germany (the G4) – matter greatly for global resilience. Although the four have different macro resilience levels, all currently have plenty of fiscal space. This wasn’t always the case. For example, Japan had very low fiscal space between 2010 and 2013 due to a strong yen which made the economy less competitive. Furthermore, it simultaneously had very negative primary balances, which have since reduced. Our analysis suggests that Japan’s high public debt burden becomes a real challenge if additional fiscal pressure points intensify. Also, and all else equal, fiscal space is generally lower in times of economic and financial stress. Our estimates of China’s fiscal space come with some uncertainty, given the complexity of its public balance sheet data.[31] However, and in any case, China has more monetary fire power as advanced economies have virtually all loosened policy over the past decade.

“四大”经济和保险市场重量级国家——美国、中国、日本和德国(G4)——对全球经济弹性至关重要。尽管这四个国家的宏观弹性水平不同，但它们目前都有很大的财政空间。但事实并非总是如此。例如，日本在 2010 年至 2013 年期间的财政空间非常小，原因是强势日元降低了日本经济的竞争力。此外，它同时有非常负的主要平衡，这已经减少。我们的分析表明，如果额外的财政压力加剧，日本的高公共债务负担将成为一个真正的挑战。此外，在其他条件相同的情况下，在经济和金融紧张时期，财政空间通常较小。考虑到中国公共资产负债表数据的复杂性，我们对中国财政空间的估计存在一些不确定性。然而，无论如何，由于发达经济体在过去十年几乎都放松了政策，中国拥有更大的货币火力。

Figure 5
“Big 4” Macroeconomic Resilience scores and components, 2018



Source: SRI-LSE Macroeconomic Resilience Index
资料来源:SRI-LSE 宏观经济复原力指数

31 For more information, see *How China failed to fail*, Institute of International Finance, 2019. However, complicated data also applies for some other countries, particularly in emerging economies.

欲了解更多信息，请参见国际金融研究所 2019 年出版的《中国是如何失败的》。不过，复杂的数据也适用于其它一些国家，尤其是新兴经济体。

China's ongoing financial de-risking is positive and is facilitated by ample fiscal and monetary policy space.
中国正在进行的金融去风险化是积极的，并得益于充足的财政和货币政策空间。

Importantly, the economic structure of the G4 economies has in aggregate not become significantly more dynamic since 2007. However, there are some noteworthy country-level developments. For example, survey results suggest that the banking sector backdrop in the US is relatively solid, but less so in Germany. Notably, Germany's measure of labour market efficiency increased substantially between 2010 and 2018, which contributes to its higher E-RI score.[32] China, meanwhile, is in transition. Financial de-risking is ongoing[33] and a wide range of reforms to facilitate economic liberalisation are being implemented. This transition also requires and is supported by ample fiscal and monetary policy space.
重要的是，自 2007 年以来，G4 经济体的总体经济结构并未显著增强。然而，在国家一级有一些值得注意的事态发展。例如，调查结果显示，美国银行业的背景相对坚实，但德国的情况就不那么坚实了。值得注意的是，德国衡量劳动力市场效率的指标在 2010 年至 2018 年期间大幅提高，这有助于提高 E-RI 得分。与此同时，中国正处于转型期。消除金融风险的工作正在进行，[33] 同时，一系列旨在促进经济自由化的改革正在实施。这种转变还需要并得到充足的财政和货币政策空间的支持。

The "Big 4" should make environmental sustainability a key policy target.
"四大"应该把环境可持续性作为一个关键的政策目标。

Given the dominance of these four countries to world output and global resilience, we encourage all to accelerate their move towards a low-carbon economy. There is substantial catch-up potential for all four on this front. Governments should make environmental sustainability a key target of national policy agendas. Germany is well positioned to emerge as a role model in this transition given its large cleantech industry, evolving energy mix and strong policy focus.[34] Domestic improvements at these levels would likely also have positive global spill-over effects.
鉴于这 4 个国家在世界产出和全球复原力中的主导地位，我们鼓励所有国家加速迈向世界低碳经济。在这方面，所有四个国家都有巨大的追赶潜力。各国政府应将环境可持续性作为国家政策议程的一个关键目标。考虑到德国庞大的清洁技术产业、不断变化的能源结构和强有力的政策重点，德国完全有能力成为这一转型过程中的榜样。34 在这些水平上的国内改善也可能产生积极的全球溢出效应。

The world's most resilient economies

Switzerland and Canada consistently rank as most economically resilient...

At the country level, the Swiss and Canadian economies have consistently ranked among the top three most resilient. Table 2 provides a snapshot of the individual components and overall E-RI scores for the five most resilient economies of our sample countries in 2018.

Table 2
The five most resilient countries in 2018

	Fiscal space	Monetary policy space	Low-carbon economy	Insurance penetration	Financial market development	Human capital	Economic complexity	Labour market efficiency	Banking industry backdrop	Economic Resilience Index (E-RI)
Switzerland	0.99	0.10	1	0.72	1	0.86	1	1	0.91	0.84
Canada	0.99	0.18	0.29	0.61	0.85	0.93	0.55	0.94	1	0.81
US	0.95	0.21	0.21	0.57	1	0.74	0.93	1	0.77	0.79
Finland	0.99	0.12	0.73	0.89	0.57	1	0.91	0.69	1	0.77
Norway	0.98	0.15	1	0.26	0.73	0.71	0.57	0.79	0.87	0.75

Note: the full country breakdown including sub-components is in the appendix.

注:包括次级组成部分在内的全部国家细目载于附录。

Source: SRI-LSE Macroeconomic Resilience Index

资料来源:SRI-LSE 宏观经济复原力指数

32 For more information, see also *The German Labor Market Reforms and Post-Unemployment Earnings,* IMF, 2015.

更多信息，参见《德国劳动力市场改革与失业后收入》，IMF，2015。

33 Financial sector de-risking is ongoing in China. See *People's Republic of China – 2018 Article IV Consultation,* IMF, 2018. For example, China's total private debt (households and non-financial corporates) to GDP was 210% in Q1 2019, according to the IIF's Global Debt Monitor database.

中国金融业的去风险化正在进行。见中华人民共和国-2018 年第四条磋商，国际货币基金组织，2018 年。例如，根据 IIF 的全球债务监测数据库，2019 年第一季度，中国私人债务总额(家庭和非金融企业)占 GDP 的 210%。

34 For more information, see *Fragile Planet: The politics and economics of the low-carbon transition,* HSBC, 2019.

欲了解更多信息，请参阅《脆弱的星球:低碳转型的政治和经济学》(FragilePlanet:ThepoliticsandeconomicsofThelow-carbontransition)，HSBC，2019。

...with strong public finances, well-developed financial markets and high insurance penetration among common features in both.
香港拥有强大的公共财政、发达的金融市场和高度的保险渗透率，这些都是两地的共同特点。

The aggregate E-RI scores of Switzerland and Canada today (0.84 and 0.81, respectively) are slightly lower than in 2007 (0.89 and 0.83), but the two did recover relatively quickly after the GFC. Key pillars of their macro resilience in the intervening years to 2018 were (1) strong public finances; (2) well-developed financial markets and high insurance penetration rates; (3) low inequality through efficient labour markets and dynamic social mobility; and (4) an overall sound banking industry backdrop.[35] Switzerland also scores very well on the environmental sustainability perspective. A main resilience shortcoming of both nations today is lack of monetary policy leeway, which has weakened significantly since 2007. Finland and Norway, two other resilient countries, broadly share the same characteristics and also score well on the inequality and sustainability dimensions.
瑞士和加拿大今天的 E-RI 总分(分别为 0.84 和 0.81)略低于 2007 年(0.89 和 0.83)，但两者在 GFC 之后恢复得相对较快。在截至 2018 年的这段时间里，瑞士宏观复原力的主要支柱是:(1)强大的公共财政;(2)发达的金融市场和高保险普及率;(3)通过有效的劳动力市场和动态的社会流动性来减少不平等;(4)整体健全的银行业背景。35 瑞士在环境可持续性方面也得分很高。两国目前的一个主要弹性缺陷是缺乏货币政策回旋余地，自 2007 年以来，货币政策回旋余地明显减弱。芬兰和挪威是另外两个具有复原力的国家，它们基本上具有相同的特点，在不平等和可持续性方面也取得了良好的成绩。

Country resilience scores need to be viewed in a global context.
国家复原力得分需要放在全球背景下看待。

However, the resilience of any country needs to be interpreted within a broader context. For example, due to Switzerland's strong links to and the size of the euro area, lower resilience in its continental neighbours is a concern for the Swiss economy. The E-IR scores help us analyse why certain countries and regions are more or less resilient, but high resilience scores do not necessarily mean a country alone can withstand any type of shock, come what may. Resilience starts at home but ultimately, it is a shared and global responsibility.
然而，任何国家的复原力都需要在更广泛的背景下加以解释。例如，由于瑞士与欧元区的紧密联系以及欧元区的规模，其大陆邻国的弹性较低是瑞士经济的一个问题。E-ir 分数帮助我们分析为什么某些国家和地区的弹性或多或少，但高弹性分数并不一定意味着一个国家可以独自承受任何形式的冲击，不管发生什么。韧性始于国内，但最终，它是一项共同的全球责任。

Stylized macro resilience takeaways
风格化的宏观弹性外卖

Absent stronger buffers, coordinated monetary and fiscal policy-making will be necessary in the event of another crisis...
如果没有更强的缓冲，在出现另一场危机时，协调一致的货币和财政政策制定将是必要的.....。

Policy choices matter for economic resilience. The IMF shows that macroeconomic policies preceding the GFC and in its immediate aftermath influenced post crisis variations in output.[36] Strong fiscal positions and unprecedented policy actions, among other things, helped mitigate output losses. However, in aggregate today policy buffers are thinner than in 2007. In the absence of quicker and more vigorous efforts to strengthen macroeconomic resilience at the country and international level, we believe more coordinated action on monetary and fiscal policy will be necessary in the event of a next global crisis.[37]
政策选择对经济复原力至关重要。国际货币基金组织表明，在全球金融委员会之前和之后的宏观经济政策影响了危机后的产出变化。然而，总体而言，今天的政策缓冲比 2007 年更为薄弱。由于没有作出更快和更有力的努力来加强国家和国际一级的宏观经济复原力，我们认为，在出现下一次全球危机时，有必要就货币和财政政策采取更加协调的行动

35 More detail on the individual components is shown in the appendix.
关于单个组件的更多细节见附录。

36 *The Global Economic Recovery 10 Years After the 2008 Financial Crisis*, IMF, 2019.
2008 年金融危机十年后的全球经济复苏》，国际货币基金组织，2019 年。

37 Ideally, the government and central banks have transparent rules of how, when and what to apply in times of crisis. See also P. Bolton et al. “How to Keep Central Banks Independent”, *Project Syndicate,* 11 July 2019.
理想的情况是，政府和中央银行在危机时期如何、何时以及应用什么方面有透明的规则。参见 p.Bolton 等人 2019 年 7 月 11 日题为”如何保持中央银行独立”的文章。

…and the time to act is now.
现在是行动的时候了。

Increasing shock absorption buffers while decreasing economic vulnerabilities often go hand in hand, and the time to act is now. Our macro resilience research provides several stylised takeaways:
在减少经济脆弱性的同时，增加缓冲减震能力往往是齐头并进的，现在就是采取行动的时候了。我们的宏观弹性研究提供了几个风格化的要点:

- Ultra-accommodative monetary policy does more harm than good. It lowers resilience by leading to artificially benign fiscal positions, inhibiting further diversification of an economy's funding sources, and constrains structural reforms.
超宽松的货币政策弊大于利。通过导致人为的良性财政状况，抑制经济资金来源的进一步多样化，并限制结构改革，它降低了弹性。

- Lower macro buffers and insufficient progress on structural reform are likely to result in more protracted recessions in the future.
宏观缓冲减少和结构性改革进展不足，可能导致未来更长时间的衰退。

- Countries should make environmental and societal sustainability a core target in their policy agendas. For example, the process of achieving the UN's SDGs and higher levels of resilience are mutually reinforcing. A society cannot pursue the SDGs without being economically resilient, and vice versa.[38] Fourteen of the 17 SDGs are directly or indirectly covered by the E-RI. Meanwhile inequalities, particularly on the gender and wage pay gap front, also need to be addressed. The IMF estimates that globally, the female labour force participation rate is about 25 ppt lower than the male rate, and gender wage gaps persist.[39] Gender inequalities restrict the talent pool of an economy and hinder efficient allocation of resources. How to move forward on such inequalities depends on a country's level of economic development. But a low level of development is no reason not to start to address the challenges, even if steps appear minor at first.
各国应将环境和社会可持续性作为其政策议程的核心目标。例如，实现联合国可持续发展目标的进程和更高水平的恢复力是相辅相成的。一个社会不可能追求可持续发展目标而不具备经济弹性，反之亦然
E-ri 直接或间接涵盖了 17 个可持续发展目标。与此同时，不平等，特别是性别和工资差距方面的不平等也需要得到解决。货币基金组织估计，在全球范围内，女性劳动力参与率比男性劳动力参与率低约 25 个百分点，两性工资差距持续存在。如何解决这些不平等问题取决于一个国家的经济发展水平。但是，低水平的发展并不是不开始应对这些挑战的理由，即使一开始步骤看起来很小。

Our analysis is a primer on macroeconomic resilience.
我们的分析是宏观经济弹性的入门。

The private and public sectors are partners in building resilience.
私营和公共部门是建设抗灾能力的合作伙伴。

- Tackling just one area of resilience can have positive spill-over effect into other areas and regions. For example, deeper financial markets are associated with higher insurance penetration, higher human capital levels and more efficient labour markets.[40] Likewise, higher insurance penetration rates reduce the impact of a shock on public finances, and hence facilitate fiscal space in times of need. It also lowers the need of individuals to borrow. Targeted measures to improve one aspect of buffers or the fundamental economic framework can uplift other dimensions of resilience at the same time, initiating positive feedback loops.
仅仅处理一个弹性领域就可以对其他领域和区域产生积极的溢出效应。例如，更深入的金融市场与更高的保险渗透率、更高的人力资本水平和更有效率的劳动力市场有关。40 同样，更高的保险渗透率可以减少冲击对公共财政的影响，从而在需要时提

供财政空间。它还降低了个人的借贷需求。采取有针对性的措施来改善缓冲区的一个方面或基本经济框架，可以同时提高复原力的其他方面，形成积极的反馈循环。

The private and public sectors share a common interest in a resilient macroeconomy, and the private sector can help strengthen public sector resilience. Our public policy wish list below in Table 3 outlines some concrete actions which we believe would contribute to stronger global macroeconomic resilience.[41]

私营部门和公共部门对有弹性的宏观经济有着共同的利益，私营部门可以帮助加强公共部门的弹性。下文表 3 中的我们的公共政策愿望清单概述了我们认为将有助于加强全球宏观经济复原力的一些具体行动

Our analysis is a primer on macroeconomic resilience. The research has received rigorous vetting from and with the LSE. All told, indexing the health of the global economy and determining the drivers of country and global shock absorption capacity is an ever-evolving exercise. We will update the country E-RIs annually, and also continuously review our methodological approach and data sources.

我们的分析是宏观经济弹性的入门。伦敦政治经济学院对这项研究进行了严格的审查。总而言之，为全球经济的健康状况编制指数并确定国家和全球减震能力的驱动因素是一项不断演变的工作。我们将每年更新国家 E-RIs，并不断审查我们的方法和数据来源。

38 SDGs such as peace, justice and strong institutions are preconditions for macro resilience. At the same time, goals around innovation, infrastructure, good health and education, and no poverty cannot be achieved without macroeconomic stability.

和平、正义和强有力的机构等可持续发展目标是宏观复原力的先决条件。与此同时，如果没有宏观经济的稳定，围绕创新、基础设施、良好的健康和教育以及没有贫困的目标就无法实现。

39 *Pursuing Women's Economic Empowerment,* IMF, 2018.

追求妇女经济赋权，国际货币基金组织，2018 年。

40 Positive correlations are between 0.4–0.55 across the entire sample.

整个样本的正相关系数在 0.4-0.55 之间。

41 This wish list is updated and amended from *sigma* 5/2018, Global economic and insurance outlook 2020, Swiss Re Institute. Other elements in that previous report, such as introducing a tradable asset class or having more public private partnerships, remain key to facilitating sustainable growth.

本愿望清单由 sigma5/2018《全球经济和保险》更新和修订 2020 年展望，瑞士再保险协会。前一份报告中的其他内容，如引入可交易的资产类别或建立更多的公私伙伴关系，仍然是促进可持续增长的关键。

Table 3
表三
Suggested actions to improve macro resilience
提高宏观弹性的建议行动

	Topic	Description
Institutions 院校	Public institutions	..Stronger public institutions, including independent central banks and multilateral institutions, are pre-conditions for a resilient economy. ..However, just because such institutions are independent does not mean that they can be overburdened with policy responses. ..Economic resilience is a shared task, across institutions and countries.
	More complete sovereign data and balance sheet collection efforts	..Governments should contribute to the IMF's public-sector balance sheet data efforts to obtain a better overview of what governments owe and own (ie, net public wealth).[42] ..This will allow for clearer analysis of vulnerabilities, buffers and areas where action in needed.
Policies 政策	Structural reform agenda	..Reform agendas are country-specific, but should generally focus on: – Greater equality in human capital, greater efficiency and flexibility in labour markets, and better development of financial markets. – In the euro area, completing the Capital Markets Union is key.
	Solidify fiscal space	..Encourage state-contingent financing instruments such as GDP-linked sovereign bonds and catastrophe risk transfers that act as counter cyclical stabilisers. ..Address implicit public-sector contingent liabilities like longevity and climate risk.
	Broader use of automatic stabilisers to address vulnerabilities	..Broader use of automatic stabilisers such as counter cyclical capital buffers for bank capital, and strong social security and unemployment insurance systems, etc. This will address economic and financial imbalances, and distribute policy responses among institutions.
	Infrastructure as a tradable asset class	..Governments should have a "ready-to-be-deployed" infrastructure project list in place. This will support longer-term economic growth prospects. ..Having a tradable infrastructure asset class would allow private-sector participation and help shoulder the investment costs.
Solutions 解决方案	Broad-based digital strategy	..To increase productivity, governments should introduce a broad-based digital strategy, including a focus on education.
	Encourage private capital market solutions	..Ensure financial development through deeper and more efficient financial markets, including insurance. ..With more supportive public policies, the private sector can play a bigger role in alleviating societal challenges and government contingent liabilities (eg, by providing capital market and re/insurance solutions to address the global retirement savings gap or public healthcare spending).
	Encourage sustainable investing	..Further progress towards the 2015 climate accord and the UN's SDGs will strengthen macro resilience. The private sector can do its part if governments agree on a common taxonomy on sustainable finance and establish a risk-based market consistent regulatory framework for Environment, Social and Governance (ESG) investments.

Source: Swiss Re Institute
资料来源:瑞士再保险协会

42 A Global Picture of Public Wealth, IMF, 2019.
国际货币基金组织，2019。

Micro resilience – measuring protection gaps and insurance coverage in place

微观复原力——衡量保护差距和保险覆盖面

Resilience against three core areas of risk – natural catastrophes, mortality and healthcare spending – has improved in both the advanced and emerging markets since the year 2000, according to our independently-developed SRI Insurance Resilience Indices. Emerging economies' resilience against mortality and healthcare improved significantly before the GFC, but progress has since tapered off. Against the backdrop of an estimated protection gap for the three risk areas combined of USD 1.2 trillion in 2018, the highest ever, the strongest gains in resilience since 2000 have come in the advanced economy property catastrophe and emerging market mortality insurance sectors.

根据我们独立开发的 SRI 保险韧性指数(SRIInsuranceResilienceindex)，自 2000 年以来，发达市场和新兴市场对风险三个核心领域——自然灾害、死亡率和医疗支出——的韧性都有所提高。在全球金融危机之前，新兴经济体应对死亡率和医疗保健的弹性显著提高，但此后进展逐渐减弱。据估计，2018 年三个风险领域的保护缺口总额为 1.2 万亿美元，是有史以来最高的，2000 年以来在复原力方面取得的最大收益来自发达经济体的财产灾难和新兴市场死亡率保险部门。

Defining and measuring micro (insurance) resilience

定义和衡量微观(保险)恢复力

We have developed indices that measure how insurance promotes the capacity of households to withstand shocks.

我们制定了衡量保险如何提高家庭抵御冲击能力的指数。

In this chapter we broaden the concept of resilience from the macro to the household and business level. In other words, micro-level resilience. We look at how insurance helps households better withstand the following shock events: natural catastrophes, death of a household's main earner, and catastrophic health expenditures, and have developed an insurance resilience index (I-RI) for each.

在本章中，我们将弹性的概念从宏观扩展到家庭和企业层面。换句话说，微观层面的弹性。我们研究了保险如何帮助家庭更好地抵御以下冲击事件:自然灾害、家庭主要收入来源的死亡和灾难性医疗支出，并为每个事件制定了保险弹性指数(I-RI)。

At the micro level, a different definition of resilience is required compared to the macro realm.

在微观层面，与宏观层面相比，弹性需要一个不同的定义。

Micro exposures require a different definition of resilience than that used at the macro level. At the micro level, static resilience refers to the depth of the impact of a shock on a household's well-being at a point in time. Dynamic resilience refers to the ability of the household to recover from a shock. For instance, households with low resilience may be forced to sell off productive assets, put accumulation of retirement assets on hold, fail to maintain health or forego education or other, in order to cope.

与宏观层面相比，微量曝光需要一个不同的弹性定义。在微观层面上，静态弹性指的是冲击在某个时间点对家庭幸福的深度影响。动态弹性是指家庭从冲击中恢复的能力。例如，弹性低的家庭可能被迫出售生产性资产，搁置退休资产的积累，无法维持健康或放弃教育或其他，以应付问题。

The SRI Insurance Resilience Indices measure the relation between protection needed and available for three core areas of risk.

社会责任投资保险复原力指数衡量了三个核心风险领域所需保护与现有保护之间的关系。

Our I-RIs are based on research into protection gaps and measure the relation between protection needed and available. The methodologies are different for each peril but the concepts are designed to provide comparable metrics. Risk exposures, insurance premiums, savings and other relevant socio-economic variables evolve over time. To measure progress in building resilience, we estimate the trend in relative terms: the protection available divided by what is needed. This also allows for more meaningful comparisons between countries and regions. To be able to make those comparisons, the protection gaps are expressed in premium equivalent terms.

我们的 I-RIs 是基于对保护差距的研究，并衡量所需保护与现有保护之间的关系。对于每种危险，方法是不同的，但是这些概念是为了提供可比较的度量而设计的。随着时间的推移，风险敞口、保险费、储蓄和其他相关的社会经济变量都会发生变化。为了衡量在建设抗灾能力方面的进展，我们以相对的方式估计趋势:可用的保护

除以所需的。这也允许在国家和地区之间进行更有意义的比较。为了能够进行这些比较，保护差距用保费等价术语来表示。

Insurance plays an instrumental part in protecting families from the financial consequences of natural disasters.

保险在保护家庭免受自然灾害造成的经济后果方面发挥了重要作用。

The SRI Natural Catastrophe Insurance Resilience Index

斯里兰卡自然灾害保险复原力指数

Natural catastrophes pose a major threat to households and businesses. Disasters lead to broad and often substantial negative impacts on the financial health of a household, with adverse impact across most associated measures including credit scores, debt in collections, bankruptcy, credit card debt, mortgage delinquency and foreclosures. These negative effects can persist or even grow over time.[43] Insurance plays an instrumental part in protecting policyholders from catastrophic financial consequences. Empirical research indicates that insurance cover increases the likelihood of rebuilding, minimises financial hardship, and speeds up recovery time.[44]

自然灾害对家庭和企业构成重大威胁。灾害对一个家庭的财务健康产生广泛而且往往是重大的负面影响，对大多数相关措施产生负面影响，包括信用评分、收债、破产、信用卡债务、抵押贷款拖欠和丧失抵押品赎回权。这些负面影响可能会持续，甚至随着时间的推移而加剧。43 保险在保护投保人免受灾难性财务后果方面发挥了重要作用。实证研究指出，保险可以增加重建的可能性，最大限度地减少财政困难，并加快恢复时间

Methodology

方法论

We follow these steps to derive the SRI Natural Catastrophe I-RI:[45]

我们按照这些步骤推导出了 SRI 自然灾害 I-RI:45

- Using *sigma* data, we estimate that insurance has covered around 33% of global economic losses from natural disasters over the last decade.

使用 sigma 数据，我们估计，在过去十年中，保险已经覆盖了全球自然灾害造成的经济损失的 33%左右。

- However, the historical picture does not capture all underlying risk exposures. Many natural catastrophes are high-impact, low-frequency events. Major earthquakes in particular are infrequent and under-represented in historical data.

然而，历史情况并不能反映所有潜在风险敞口。许多自然灾害是高影响、低频率的事件。特别是大地震很少发生，而且在历史数据中代表性不足。

- Hence, we supplement historical data with a modelled forward-looking view, using Swiss Re's natural catastrophe risk model MultiSNAP.

因此，我们使用瑞士再保险公司的自然灾害风险模型 MultiSNAP，用模型前瞻性的观点来补充历史数据。

- The model generates expected loss distributions for three major perils: seismic events, windstorms and floods in the countries with largest exposures.

该模型针对三个主要风险:地震事件、风暴和洪水，在风险暴露最大的国家产生预期损失分布。

- For our Natural Catastrophe I-RI, we use these probabilities and estimated market portfolios of economic and insured values to assess the annual expected total and insured losses caused by each peril in 2018, across a sample 34 countries.

对于我们的自然灾害 I-RI，我们使用这些概率和经济和保险价值的估计市场投资组合来评估 2018 年每一种危险所造成的年度预期总损失和保险损失，样本来自 34 个国家。

- We complement the proprietary model scenarios with expected loss estimates for another 120 countries from the United Nations Office for Disaster Risk Reduction's *Global Assessment Report*.

我们从联合国减少灾害风险办公室的《全球评估报告》中为另外 120 个国家的预期损失估计数补充了专有模型假设情景。

Regional index values back to 2000 are then derived by back-casting the current model estimates for 2018, based on changes in the share of average historic insured vs economic losses for a region, as per Swiss Re Institute's catastrophe loss database.

根据瑞士再保险研究所的灾难损失数据库，根据一个区域的平均历史保险与经济损失比例的变化，通过回溯当前模型对 2018 年的估计，得出回到 2000 年的区域指数值。

43 *Insult to Injury: Natural Disasters and Financial Health Highlights,* Urban Institute, April 2019.

侮辱到伤害:自然灾害和财务健康亮点，城市研究所，2019 年 4 月。

44 C. Kousky, "The Role of Natural Disaster Insurance in Recovery and Risk Reduction", *Annual Review of Resource Economics* 11, 2019.

库斯基，"自然灾害保险在恢复和减少风险中的作用"，资源经济学年度评论，2019 年 11 月。

45 In addition to personal lines risks, commercial risks are also included in the property catastrophe modeling underlying this index.

除了个人线风险，商业风险也包括在该指数的财产巨灾模型中。

Micro resilience – measuring protection gaps and insurance coverage in place
微观复原力——衡量保护差距和保险覆盖面

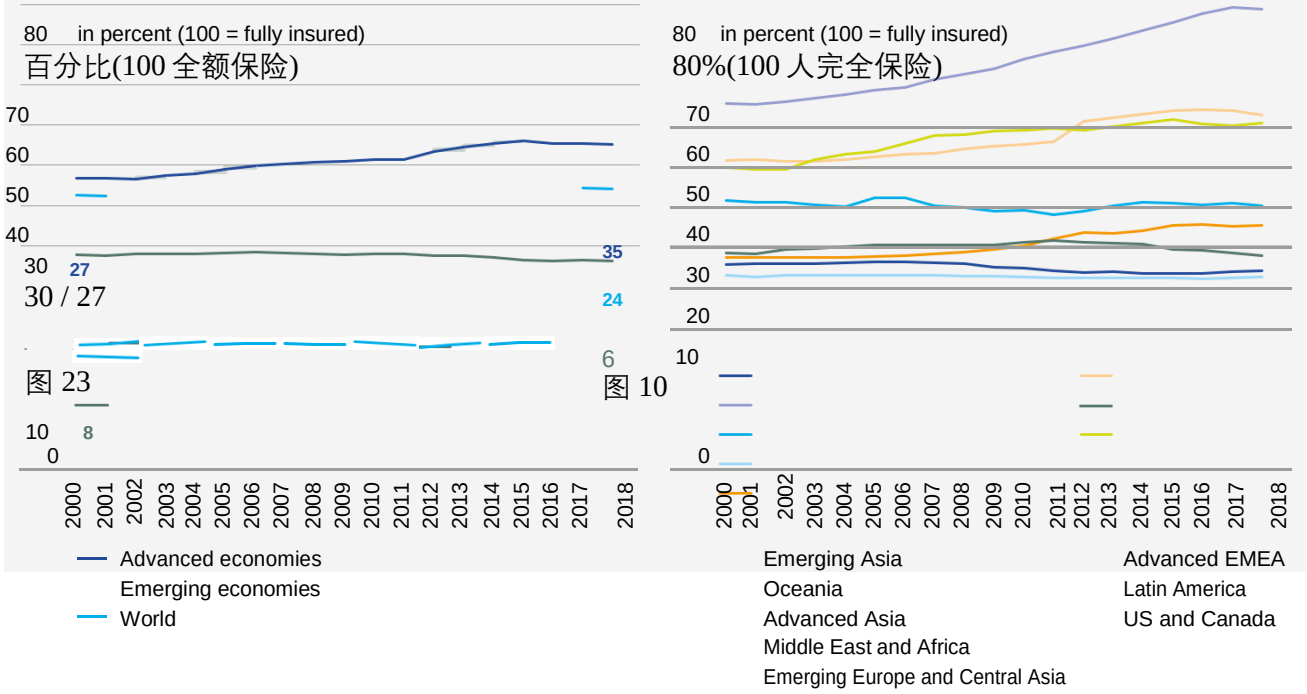
The SRI Natural Catastrophe (storms, earthquakes and floods) Resilience Index for 2018 is at a low level.

Sri2018 年自然灾害(风暴、地震和洪水)恢复指数处于低水平。

We estimate global natural catastrophe losses resulting from the three named perils of USD 292 billion for 2018, and a protection gap of USD 222 billion in premium equivalent terms. The protection gap is 76% of the modeled exposure, meaning that the world I-RI for 2018 is 24%. The largest protection gap is for earthquakes (USD 135 billion), followed by floods (USD 50 billion) and storms (USD 37 billion). As a share of exposure, the gap varies widely by peril. It is highest for earthquakes (87%) and floods (73%), and lowest for storms (41%).

我们估计，2018 年全球自然灾害损失由上述三个风险造成，为 2,920 亿美元，保险费相当于 2,220 亿美元。保护间隙是模型暴露的 76%，这意味着 2018 年世界 I-RI 是 24%。最大的保护缺口是地震(1350 亿美元)，其次是洪水(500 亿美元)和风暴(370 亿美元)。作为风险敞口的一部分，两者之间的差距因危险程度不同而有很大差异。最高的是地震(87%)和洪水(73%)，最低的是风暴(41%)。

Figure 6
图 6
Global and regional natural catastrophe insurance resilience indices, 2000–18
2000-2018 年全球和区域自然灾害保险复原力指数



Source: Swiss Re Institute
资料来源:瑞士再保险协会

The global natural catastrophe I-RI has improved just modestly from 2000, as less resilient emerging economies gain importance.

随着弹性较差的新兴经济体变得更加重要，全球自然灾害 I-RI 自 2000 年以来略有改善。

The global natural catastrophe I-RI has increased just marginally over the last two decades, up 1.5 ppts between 2000 and 2018. The aggregate I-RI for advanced economies increased strongly (+8 ppt) over the same period, but declined slightly for emerging economies (–1.5 ppt, see Figure 6), particularly after 2007. The growing weight of emerging economies with lower I-RI values partly offsets the improvement in the mature economies in the aggregate world index. By region, Oceania has the highest I-RI score, due to compulsory earthquake covers in New Zealand, and success in efforts to increase uptake of flood insurance in Australia. Oceania, advanced EMEA, Emerging Europe and Central Asia saw the biggest improvements in their respective I-RIs through 2018.[46] Asia and Middle East saw just modest increases, and resilience in Africa

declined. The decline in emerging economies' natural catastrophe I-RI is a consequence of strong economic growth over the last two decades having outpaced the development of the private insurance sector in many markets.

在过去 20 年里，全球自然灾害 I-RI 略有增加，从 2000 年到 2018 年上升了 1.5 个百分点。发达经济体的总体 I-RI 同期强劲增长(+8ppt)，但新兴经济体略有下降(-1.5ppt，见图 6)，尤其是在 2007 年之后。I-ri 值较低的新兴经济体的权重不断增加，在一定程度上抵消了成熟经济体在全球总体指数方面的改善。按地区划分，大洋洲拥有最高的 I-RI 得分，因为强制性地震覆盖在新西兰，并在努力提高采用洪水保险在澳大利亚的成功。2018 年，大洋洲、欧洲、新兴欧洲和中亚各自的国际收支指数取得了最大的进步。46 亚洲和中东的国际收支指数仅略有增长，而非洲的复原力则有所下降。新兴经济体自然灾害 I-RI 的下降是过去 20 年来经济强劲增长的结果，这种增长速度超过了许多市场中私营保险部门的发展速度。

46 For advanced EMEA, there was a significant increase in the flood insurance take-up in Germany and the introduction of the Flood Re scheme in the UK. For Turkey, a mandatory earthquake scheme was introduced in 2000. While the take-up rate was low at the beginning, it improved over time.

对于先进的 EMEA，有一个显着增加的洪水保险采取了在德国和引入洪水再计划在英国。土耳其在 2000 年推出了强制性地震计划。虽然采取率低在开始时，它随着时间的推移有所改善。

The SRI Mortality Insurance Resilience Index

社会责任保险死亡率弹性指数

For decades, life insurers focused on selling savings rather than life coverage. This has changed since the global financial crisis.

几十年来，人寿保险公司一直专注于销售储蓄而非人寿保险。自全球金融危机以来，这种情况发生了变化。

Originally, risk protection – and mortality coverage in particular – was the main focus and value proposition of life insurers. Over time, however, many insurers have shifted their core competency away from risk protection to managing retirement savings.[47] This is reflected in the relatively small share of life insurance premiums stemming from risk protection compared to savings-type businesses. However, since the GFC and subsequent ultra-low interest rates, protection business has become more attractive again and life insurers have been promoting biometric risk products. This is a positive development given that many households still lack adequate financial protection against the premature death of a primary breadwinner.

起初，风险保护----特别是死亡率保险----是人寿保险公司的主要重点和价值主张。然而，随着时间的推移，许多保险公司已将其核心竞争力从风险保障转移到管理退休储蓄。47 这反映在与储蓄型企业相比，风险保障产生的人寿保险保费所占份额相对较小。然而，由于全球金融中心和随后的超低利率，保险业务再次变得更具吸引力，人寿保险公司一直在推广生物特征风险产品。这是一个积极的事态发展，因为许多家庭仍然缺乏足够的经济保护，以免主要养家者过早死亡。

The mortality protection gap is the difference between resources needed by surviving dependents to sustain living standards, and the resources available.

死亡率保护差距是生存下来的受抚养人维持生活水平所需的资源与现有资源之间的差距。

The mortality protection gap is the difference between the amount needed to substitute a household's future income in the event of death of a major breadwinner, and the resources available to repay outstanding debts (eg, mortgages) and sustain living standards. Resources available include existing financial assets, proceeds from life insurance policies and social security payments. The portion of the need that cannot be replaced by these existing resources is the mortality protection gap. The gap increases with rising household incomes, as normally happens over the lifespan of a breadwinner, and over time as an economy develops. It also rises in tandem with increasing debt levels. The size of the gap is inversely correlated with the build-up of insurance coverage, financial assets and social security benefits.

死亡率保护差距是在主要养家者死亡时替代家庭未来收入所需金额与用于偿还未偿债务(例如抵押贷款)和维持生活水平的资源之间的差额。可用资源包括现有金融资产、人寿保单收益和社会保障金。这些现有资源无法替代的需求部分是死亡率保护差距。这种差距随着家庭收入的增加而扩大，这种情况通常发生在养家糊口者的一生中，随着经济的发展也会发生。它还随着债务水平的上升而上升。差距的大小与保险覆盖面、金融资产和社会保障福利的增加成反比。

Methodology

方法论

We follow these steps to derive the SRI Mortality I-RI:

我们按照以下步骤推导出社会责任投资死亡率 I-RI:

- Based on limited data availability for the full distribution of households, mortality protection gap estimates are derived using average information for the working population with dependents:

根据家庭全面分布的有限数据，利用有受抚养人的工作人口的平均信息得出了死亡率保护差距估计数:

  – average household income;

  一家庭平均收入;

  – average net worth of households;

  一住户平均资产净值;

  – average social security payments to survivors; and

向幸存者支付的平均社会保障金;

– average life insurance coverage.

-平均人寿保险。

We only estimate income replacement up to retirement age. The issue of insufficient funding of retirement savings is out of scope for this analysis.

我们只估计到退休年龄的收入折合养老金。退休储蓄资金不足的问题不属于本分析的范围。

The Mortality I-RI measures the development of insurance protection in relative terms (ie, protection available divided by protection needed).

死亡率 I-RI 衡量保险保护的发展在相对的条件(即，保护可用除以保护需要)。

Swiss Re Institute has published regional mortality protection gap numbers before, but not on a global basis.[48] In this *sigma*, the regional methodologies have been standardised across all markets studied, which means the resulting mortality protection gap figures may differ from previous region-specific publications.

瑞士再保险研究所以前发表过区域死亡率保护差距数字，但不是全球性的。

Also, our prior publications express mortality protection gaps in terms of sums assured. In this *sigma*, we use premium equivalent terms to facilitate comparison with natural catastrophe and health insurance protection gaps.

此外，我们先前的出版物表明死亡率保护差距的保证金额。在这个标准差中，我们使用保费等价术语，以便于与自然灾害和健康保险保护差距进行比较。

47 See *sigma* 4/2004: Mortality protection: the core of life, Swiss Re.

见 sigma4/2004:死亡保护:生命的核心，瑞士再保险。

48 For prior research and applications of similar methodologies see *Life underinsurance in the US: bridging the USD 25 trillion mortality protection gap,* Swiss Re Institute, 2018; *Mortality Protection Gap: Asia-Pacific,* Swiss Re, 2015; and *The Mortality Protection Gap in Latin America*, Swiss Re, 2013.

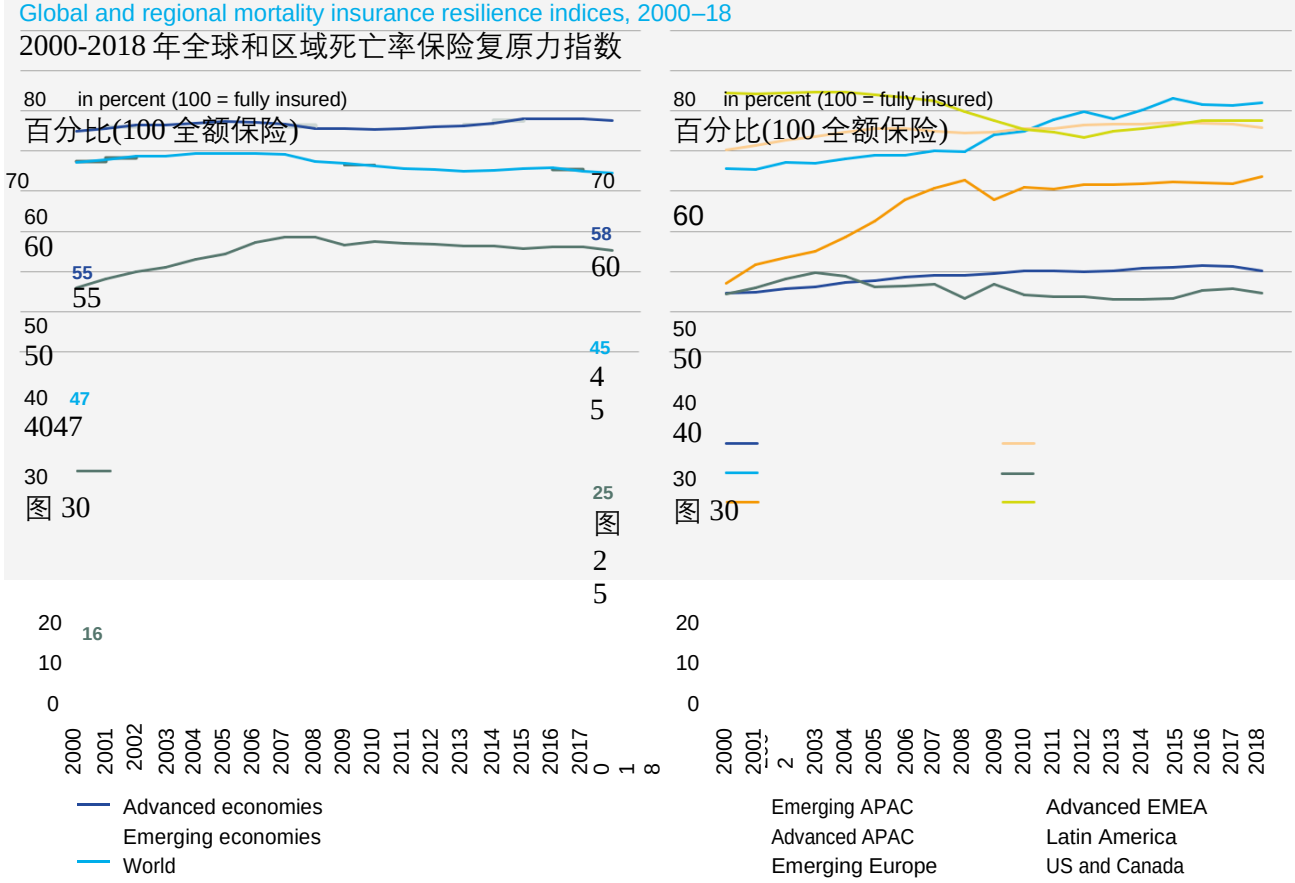
有关先前类似方法的研究和应用，见美国人寿保险不足:弥合 25 万亿美元的死亡率保护差距，瑞士再保险研究所，2018 年;死亡率保护差距:亚太，瑞士再保险，2015 年;拉丁美洲死亡率保护差距，瑞士再保险，2013 年。

Micro resilience – measuring protection gaps and insurance coverage in place
微观复原力——衡量保护差距和保险覆盖面

In 2018, about 45% of the funds needed to maintain household living standards came from life insurance and other sources.
2018 年，维持家庭生活水平所需资金的 45%左右来自人寿保险和其他来源。

Subtracting protection available from protection needed, we estimate a global mortality protection gap in premium equivalent terms of USD 386 billion in 2018. This translates into a global Mortality I-RI (protection available as a % of protection needed) of 45% (see Figure 7). In other words, globally, 45% of funds needed to maintain household living standards in the event of the death of the primary breadwinner are “protected” by either life insurance, social security survivor benefits or through household savings. At aggregate level, this is a 2 ppt decline since 2000. As in the case of natural disaster risks, the decline in the global index has largely been driven by the increasing weight of emerging markets with lower I-RI values.
减去所需保护的现有保护，我们估计 2018 年全球死亡率保护差距相当于保费 3,860 亿美元。这转化为一个全球死亡率 I-RI(保护可作为所需保护的百分之四十五)为 45%(见图 7)。换言之，在全球范围内，在主要养家者死亡的情况下，维持家庭生活水平所需资金的 45%得到人寿保险、社会保障遗属津贴或家庭储蓄的”保护”。就总体水平而言，这是自 2000 年以来的 2 个百分点的下降。与自然灾害风险一样，全球指数的下降主要是由于 I-RI 值较低的新兴市场的权重不断增加。

Figure 7
图 7
Global and regional mortality insurance resilience indices, 2000–18
2000-2018 年全球和区域死亡率保险复原力指数



Source: Swiss Re Institute
资料来源:瑞士再保险协会

In relative terms, the insurance industry has made progress in narrowing the mortality protection gap since 2000, particularly in emerging markets.
相对而言，自 2000 年以来，保险业在缩小死亡率保护差距方面取得了进展，尤其是在新兴市场。

Europe and advanced Asia Pacific are likewise more resilient.
欧洲和发达的亚太地区也同样更具弹性。

Standing at 25% in 2018, the emerging market Mortality I-RI has risen strongly since 2000, by 9 ppt. The improvement was concentrated in the years before the GFC and peaked in 2007–08. The current level of the emerging market index is still less than half the I-RI level for advanced markets, which rose to 58% in 2018 from 55% at the turn of the century. In advanced markets, too, the I-RI climbed in the pre-crisis years and then dipped in 2009, before rising again. Among the advanced markets, the mortality I-RI for the US was noticeably lower in 2018 than in 2000, as wage replacement needs and debt have grown faster than accumulated financial assets and near-stagnant life coverage. Nevertheless, the mortality protection gap there has narrowed since 2012 in both real absolute terms and relative terms.

2018 年新兴市场死亡率 I-RI 为 25%，自 2000 年以来强劲上升了 9 个百分点。这种改善主要集中在全球金融中心成立之前的几年，并在 2007-08 年达到高峰。新兴市场指数目前的水平仍不到发达市场 I-RI 水平的一半，I-RI 水平从本世纪初的 55%上升到 2018 年的 58%。在发达市场也是如此，I-RI 在危机前几年上升，然后在 2009 年下降，之后再次上升。在发达市场中，美国 2018 年的 I-RI 死亡率明显低于 2000 年，因为工资替代需求和债务的增长速度快于累积的金融资产和几乎停滞不前的生活保障。然而，自 2012 年以来，那里的死亡率保护差距在绝对值和相对值两方面都有所缩小。

In Europe, most markets are relatively more resilient today than in 2000, but most of the improvement came before the GFC. In Asia Pacific (APAC), the mortality protection gap has widened in absolute terms in all countries except Japan since 2005, and most significantly in China and India. In relative terms, the insurance industry has made good progress in narrowing the gap in many countries in advanced APAC specifically: life insurance penetration rates in Taiwan, Hong Kong, South Korea and Japan are among the highest in the world, driven by savings-type products.

在欧洲，大多数市场今天比 2000 年更有弹性，但大多数改善是在全球金融中心之前。在亚太地区，自 2005 年以来，除日本以外的所有国家的死亡率保护差距都有所扩大，其中中国和印度的差距最为明显。相对而言，保险业在缩小许多国家与亚太区保险业的差距方面取得良好进展，尤其是台湾、香港、南韩和日本的寿险普及率在储蓄型产品的推动下，位列全球最高之列。

Each year, 100 million people are pushed into poverty on account of healthcare expenditures.

每年有 1 亿人因为医疗支出而陷入贫困。

The SRI Health Insurance Resilience Index

社会责任投资健康保险韧性指数

Healthcare is an important contributor to a nation's micro resilience. According to the World Health Organization (WHO), more than half of the world's population still has no cover for essential health services. Further, about 100 million people are pushed into extreme poverty each year because of healthcare expenses (around every tenth spends at least 10% of the household budget on healthcare). All UN member states are targeting universal health coverage (UHC) by 2030 as part of the SDGs.[49]

医疗保健是一个国家微观复原力的重要贡献者。根据世界卫生组织(WHO)，世界上一半以上的人口仍然没有基本卫生服务的保障。此外，每年大约有 1 亿人由于医疗保健费用而陷入极端贫困(大约十分之一的人至少将家庭预算的 10%用于医疗保健)。作为可持续发展目标的一部分，所有联合国成员国都将在 2030 年前实现全民医保

Methodology

方法论

We follow these steps to derive the SRI Health I-RI Index:

我们按照以下步骤推导出 SRI 健康 I-RI 索引:

- Our index measures the healthcare funding gap (actual spending on healthcare not covered by government or insurance schemes) only. The index does not consider the so-called treatment gap (ie, required healthcare services not accessed because of lack of availability or affordability).

我们的指数仅衡量医疗资金缺口(政府或保险计划未涵盖的实际医疗支出)。该指数没有考虑所谓的治疗差距(即由于缺乏可用性或负担能力而无法获得所需的医疗服务)。

- We estimate the ratio between protection available from public and private schemes and protection needed. Available protection is the difference between total healthcare expenditures and households' stressful out-of-pocket (OOP) expenses. Needed protection is total healthcare expenditure.[50]

我们估计了公共和私人计划提供的保护与所需保护之间的比例。可获得的保护是总医疗支出和家庭应激性自付(OOP)支出之间的差异。所需的保护是医疗保健开支总额

- The index requires an estimation of what level of OOP spending on health is stressful for households, which depends on a country's development status. In advanced economies, for instance, a larger share of OOP healthcare expenditure is part of co-insurance and deductibles.

该指数要求估计家庭在面向对象的医疗支出上的压力程度，这取决于一个国家的发展状况。例如，在发达经济体中，面向对象的医疗支出中有很大一部分是共同保险和免赔额。

- These are a design element of insurance plans, the aim being to incentivise people to consume healthcare services responsibly and to reduce costs. See the appendix for further details on the determination of the benchmark for stressful OOP healthcare spending.

这些都是保险计划的设计要素，目的是鼓励人们负责任地消费医疗服务，并降低成本。有关压力性 OOP 医疗支出基准测定的进一步详细信息，请参阅附录。

- Swiss Re Institute has published regional health protection gap numbers for Asia before, based on household survey data.[51] For the global analysis conducted here, we have developed a benchmark model based on country-level macro data.

瑞士再保险研究所以前曾根据住户调查数据公布过亚洲地区的健康保护差距数字。51 在这里进行的全球分析中，我们根据国家一级的宏观数据开发了一个基准模型。

Our prior publications express the healthcare protection gaps in terms of sums assured. Here we use premium equivalents to be able to compare with the other risk areas.

我们以前的出版物表达了医疗保障方面的保证金缺口。在这里，我们使用等价溢价来与其他风险领域进行比较。

49 UHC means all individuals receive the health services they need without suffering financial hardship.

”全民健康保险”是指所有个人都能得到他们所需要的保健服务，而不必遭受经济困难。

50 This concept is somewhat different from the other two perils covered in this chapter in terms of how insurance coverage plays a role in the definition of the resilience index.

这一概念在保险范围如何在复原力指数的定义中发挥作用方面与本章所述的其他两个危险有所不同。

51 *Closing Asia's USD 1.8 trillion health protection gap,* Swiss Re Institute, 2018.

缩小亚洲 1.8 万亿美元的健康保护差距，瑞士再保险协会，2018 年。

At 93%, the SRI Health I-RI is high compared to the other risk areas, due to UHC but also the specifics of our methodology.
在 93%，SRI 健康 I-RI 是高于其他风险领域，由于 UHC 和我们的方法的具体。

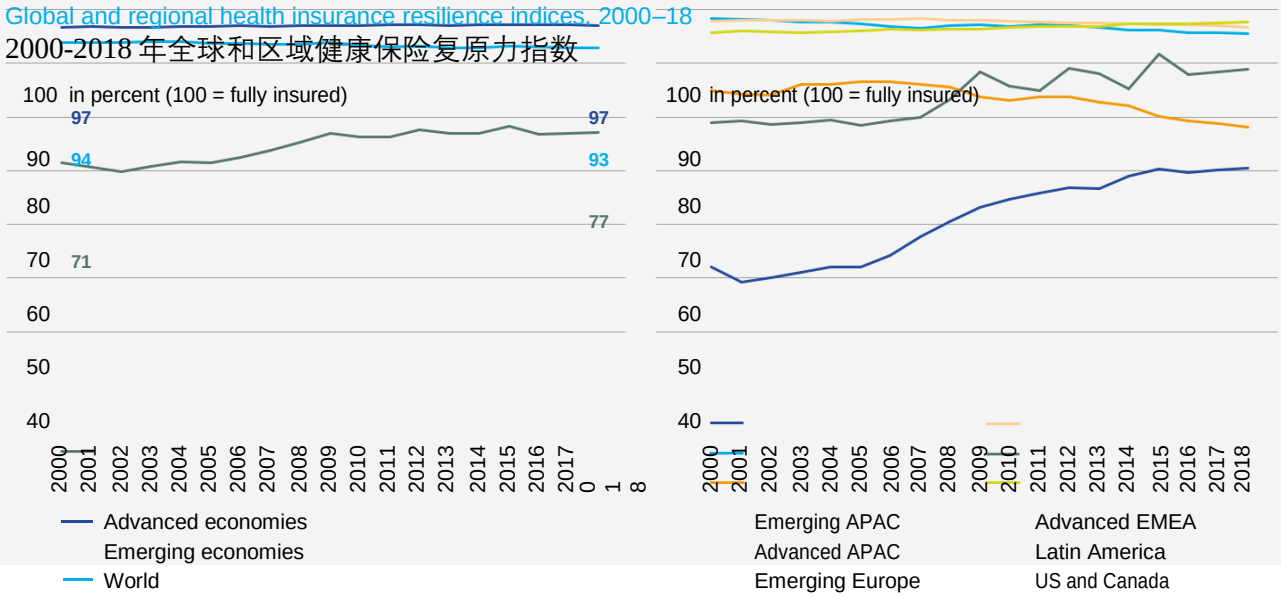
Many countries have already made good progress in moving towards UHC. This in part explains why the I-RI for health is relatively high (93%) compared to the other risk areas in focus. Governments play a major role in this. Another reason for the relative strength of the healthcare index lies in our methodology, such that we only measure the funding gap, not the treatment gap. If the latter were included, the index value would be significantly lower. All told, even though the resilience index is high, at USD 616 billion the protection gap in terms of premium equivalents is the highest of the three risk areas. The sizable gap is due to the high spending on healthcare as a percentage of GDP. Most countries therefore have scope to expand pre-funded healthcare. However, the public sector is facing funding pressure in many areas, and governments are finding it increasingly difficult to cater to the growing healthcare needs of ageing populations and increasing associated costs.
许多国家已经取得了良好的进展，走向 UHC。这在一定程度上解释了为什么健康的 I-RI 相对于其他重点危险区域相对较高(93%)。政府在这方面扮演着重要角色。医疗保健指数相对强劲的另一个原因在于我们的方法，即我们只衡量资金缺口，而不是治疗缺口。如果把后者包括在内，指数值会低得多。总而言之，尽管弹性指数很高，但在三个风险领域中，保险费等价物方面的差距最大，为 6,160 亿美元。之所以出现这么大的差距，是因为医疗支出占 GDP 的比例很高。因此，大多数国家都有扩大预付资金医疗保健的空间。然而，公共部门在许多领域面临资金压力，政府发现越来越难以满足老龄人口日益增长的医疗需求和不断增加的相关成本。

In many countries, health insurance is seen as a social policy necessity.
在许多国家，医疗保险被视为社会政策的必要性。

Figure 8 shows how the Health I-RI has evolved since 2000.[52] Globally, the I-RI decreased marginally from 94% in 2000 to 93% in 2018, the decline driven by the increasing weight of emerging markets in the world index. At the same time, the higher level of the index is not directly comparable to the natural catastrophe and mortality I-RIs. Estimated catastrophic OOP expenses are compared to total aggregate healthcare expenditures in the index, not just catastrophic expenses. The higher overall levels of coverage are also driven by the high share of government and mandatory private insurance spending on health. Compared to natural catastrophe events and premature death, the perception in many countries is that health insurance is a social policy necessity. Most progress over 2000 to 2018 was made in emerging APAC, where the Health I-RI increased from 52% to 70%. This reflects the major UHC reforms implemented in China, India, Indonesia, Philippines, Thailand and Vietnam.[53] Meanwhile, rising healthcare costs and ageing populations in most of advanced Asian and European countries have strained government budgets, leading to slower growth in public healthcare budgets and higher OOP spending.
图 8 显示了健康 I-RI 自 2000 年以来的演变情况。52 在全球范围内，I-RI 从 2000 年的 94%小幅下降到 2018 年的 93%，下降的原因是新兴市场在世界指数中的权重不断增加。与此同时，该指数的较高水平并不能直接与自然灾害和死亡率 I-RIs 相比较。估计的灾难性 OOP 开支与指数中的总体医疗开支相比较，而不仅仅是灾难性开支。政府和强制性私营保险公司在医疗保健方面的支出所占比例较高，也推动了总体覆盖率的提高。与自然灾害事件和过早死亡相比，许多国家的看法是，医疗保险是社会政策的必要条件。2000 年至 2018 年期间的大部分进展是在新兴的亚太地区取得的，其中卫生 I-RI 从 52%增加到 70%。这反映了中国、印度、印度尼西亚、菲律宾、泰国和越南实施的重大 UHC 改革。53 与此同时，大多数亚

洲和欧洲发达国家不断上升的医疗成本和人口老龄化使政府预算吃紧，导致公共医疗预算增长放缓，OOP 支出增加。

Figure 8
图 8
Global and regional health insurance resilience indices, 2000–18
2000-2018 年全球和区域健康保险复原力指数



Source: Swiss Re Institute
资料来源:瑞士再保险协会

52 Due to lack of data, the two most recent years (2017 and 2018) are projections.
由于缺乏数据，最近两年(2017 年和 2018 年)是预测。

53 Wagstaff, A. et al “Measuring progress towards universal health coverage: with an application to 24 developing countries”, *Oxford Review of Economic Policy*, 32(1), 2016.
Wagstaff，a. et A.“ Measuring progress towards universal health coverage: with A. application to 24 developing countries”，Oxford Review of Economic Policy，32(1)，2016。

The composite SRI Insurance Resilience Index
社会责任投保复原力综合指数

To assess the levels and changes in overall population welfare effects, it is helpful to aggregate the different sub-indices into a composite I-RI.
为了评估总体人口福利效应的水平和变化，有必要将不同的分指数综合成一个综合的 I-RI。

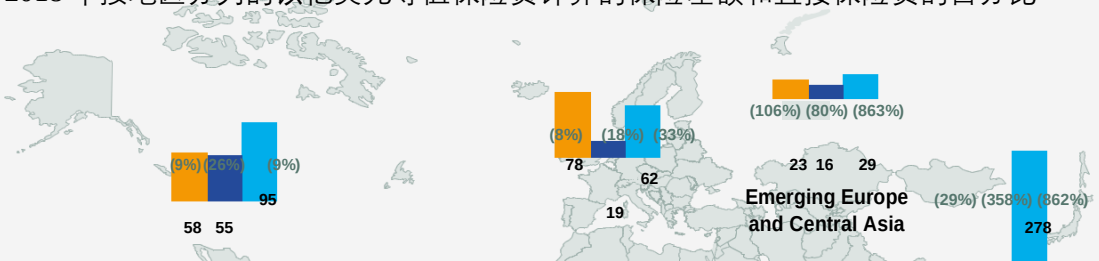
Towards a holistic measure of insurance resilience
建立保险复原力的综合衡量标准

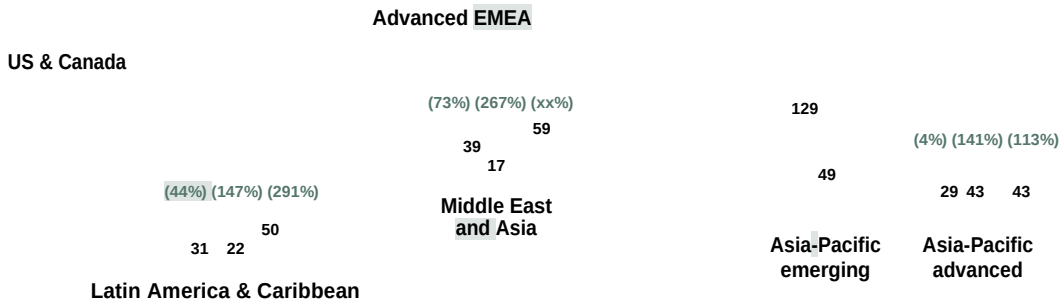
The relevance of micro insurance resilience for policy makers lies in the aggregation of cover and vulnerabilities that drive the overall welfare of a population. To assess levels and changes in overall welfare effects, it is helpful to aggregate the above sub-indices into a composite I-RI. As a starting point, Figure 9 shows the regional distribution of protection gaps for our three main perils. Key observations are:

小额保险抵御能力对决策者的相关性在于，将推动人口总体福祉的保险和脆弱性汇总起来。为了评估整体福利效应的水平和变化，将上述分项指数合并为一个综合的 I-RI 是有帮助的。作为一个起点，图 9 显示了我们三个主要危险的保护差距的区域分布。主要观察结果如下:

- The global natural catastrophe protection gap in premium equivalent terms was USD 222 billion in 2018. The protection gap for mortality risks was USD 386 billion, and it was USD 616 billion for healthcare spending risks.
  全球自然灾害保护差距在保费当量的术语是 2018 年为 2,220 亿美元。死亡风险的保护缺口为 3,860 亿美元，保健开支风险为 6,160 亿美元。
- Emerging Asia has the largest aggregate protection gap for the three risk areas combined (USD 456 billion).
  在这三个风险领域加起来，新兴亚洲拥有最大的总体保护缺口(4,560 亿美元)。
- The US and Canada combined have the second largest combined protection gap (USD 208 billion), mostly driven by the US (USD 194 billion).
  美国和加拿大加起来有第二大的综合保护差距(2080 亿美元)，主要由美国(1940 亿美元)驱动。
- Advanced EMEA has the third largest combined protection gap (USD 159 billion). It is the only region where the mortality protection gap is the largest of the three. That includes higher than the healthcare protection gap, which reflects the well-established healthcare systems in the region.
  先进的 EMEA 有第三大的综合保护差距(1590 亿美元)。这是三个地区中死亡率保护差距最大的唯一一个地区。其中包括高于医疗保障差距的差距，这反映出该地区健全的医疗保障体系。
- Advanced Asia is the only region where the natural catastrophe protection gap is the largest of the three, given the large earthquake exposures there.
  鉴于亚洲地区的大地震风险，亚洲发达地区是三个地区中自然灾害保护缺口最大的地区。

Figure 9
图 9
Protection gaps in USD billion premium equivalent terms and as % of direct premiums, by region, 2018
2018 年按地区分列的以亿美元等值保险费计算的保险差额和直接保险费的百分比





Mortality
死亡率
Natural catastrophe
自然灾害
Health
健康

Note: The numbers in parenthesis refer to protection gaps as % of total direct premium written for the respective line of business. For mortality it refers to the whole life market, including savings premiums; for property catastrophe it is all property premiums. The global protection gap in 2018 for mortality risk was 14% of total direct premiums written. For natural catastrophe risk it was 56%, and for healthcare 46%.

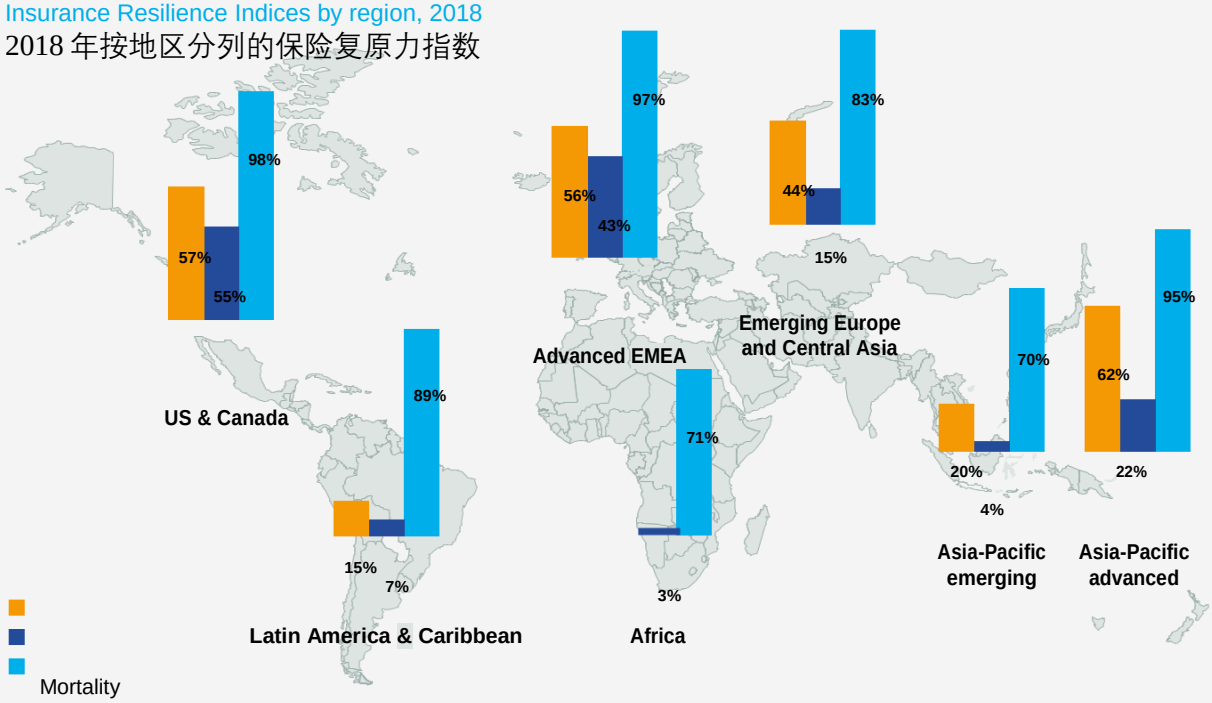
注:括号中的数字是指为各自业务范围写入的总直接保费的%的保护缺口。对于死亡率，它指的是整个人寿市场，包括储蓄溢价;对于房地产灾难，它指的是所有房地产溢价。2018 年全球死亡风险保护差距是总直接保费的 14%。自然灾害风险为 56%，医疗保健为 46%。

Source: Swiss Re Institute
资料来源:瑞士再保险协会

Micro resilience – measuring protection gaps and insurance coverage in place
微观复原力——衡量保护差距和保险覆盖面

In relative terms, the US, Canada and advanced EMEA have the highest natural catastrophe I-RIs, advanced APAC the highest mortality I-RI, and the US, Canada and advanced EMEA the highest health I-RIs (see Figure 10).
相对而言，美国、加拿大和先进的 EMEA 拥有最高的自然灾害 I-RIs，先进的 APAC 拥有最高的死亡率 I-RI，而美国、加拿大和先进的 EMEA 拥有最高的健康 I-RIs(见图 10)。

Figure 10
图 10
Insurance Resilience Indices by region, 2018
2018 年按地区分列的保险复原力指数



Source: Swiss Re Institute
资料来源:瑞士再保险协会

The I-RI values for the different risk areas are all lower in emerging economies.
不同风险领域的 I-RI 值在新兴经济体都较低。

Next we aggregate the regional I-RIs for the different risk areas into global I-RIs, weighted according to protection need. Figure 11 summarises the global insurance resilience sub-indices and the aggregate protection gaps for the three risk areas between 2000 and 2018. Due to conceptual differences, the levels of the sub-indices for different risks are not directly comparable. Changes in the indices, however, are. A summary of key observations and associated explanations:
接下来，我们将不同风险区域的区域 I-RIs 汇总到全球 I-RIs 中，并根据保护需求进行加权。图 11 总结了 2000 年至 2018 年期间全球保险抵御能力分指数和三个风险领域的总体保护差距。由于概念上的差异，不同风险的分项指数的水平是不能直接比较的。然而，指数的变化是。主要意见和相关解释摘要:

- There was a marginal increase in the global resilience index against natural catastrophes from 2000 and 2018 to a low level of 24%; a small decline from 47% to 45% in the global mortality index; and a modest dip for in the health resilience index from 94% to 93%.

自 2000 年和 2018 年以来，全球抵御自然灾害的能力指数略有上升，达到 24%的低水平;全球死亡率指数从 47%小幅下降到 45%;健康恢复指数从 94%小幅下降到 93%。

- The downward bias in the global aggregates is due to the stronger growth of the emerging economies over the last two decades, and the lower levels of insurance penetration in those countries. The I-RI values for all the different risk areas are lower in the emerging economies than in the advanced.

全球总量呈下降趋势的原因是，过去 20 年来新兴经济体增长较强，而这些国家的保险普及率较低。新兴经济体所有不同风险领域的 I-RI 值都低于发达经济体。

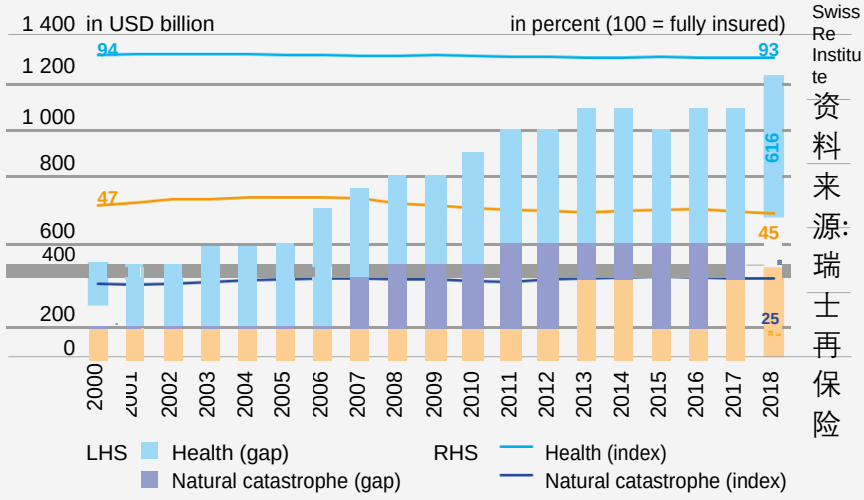
- Natural catastrophe is the only area where global insurance cover grew at a slightly higher pace (6.8%) than risk exposure. Nevertheless, the natural catastrophe protection gap grew by 6.4%, also faster than GDP growth of 5.3%.

自然灾害是全球保险覆盖率比风险增长率略高(6.8%)的唯一领域。然而，自然灾害保护缺口增长了 6.4%，也比 GDP 增长 5.3%要快。

- Strong improvements in emerging market mortality and healthcare resilience came in the years 2000–07. Improvements stalled and tapered off after the GFC.

2000 年至 2007 年间，新兴市场死亡率和医疗保健弹性均有明显改善。改进在 GFC 之后停滞不前并逐渐减少。

Figure 11
图 11
Comparison of global protection gaps and SRI Insurance Resilience Indices
全球保护差距与 SRI 保险复原力指数的比较



Source: Swiss Re Institute
资料来源:瑞士再保险

协会

100
100

80
80

60
60

40
40

20
图 20

0

The composite I-RIs aggregating the three risk areas improved for both mature and emerging economies between 2000 and 2018.

2000 年至 2018 年期间，成熟经济体和新兴经济体三个风险领域的综合 I-RIs 得到改善。

Figure 12 shows the aggregation of the three sub-indices for the three risk areas into our global I-RI. Due to the differences between the three risks and the underlying concepts of their respective I-RIs, we use equal weights for each in the overall index.[54] Key observations are:

图 12 显示了三个风险领域的三个次级指数在全球 I-RI 中的总和。由于这三种风险与它们各自的国际收支指数的基本概念之间的差异，我们在总指数中对每种风险采用相同的权重。54 主要观察结果如下:

- The all-peril protection gap for global catastrophic health, mortality and natural catastrophe risks combined increased by about USD 627 billion to USD 1.2 trillion between 2000 and 2018 in premium dollar equivalent terms, the highest ever.

2000 年至 2018 年期间，全球灾难性健康、死亡率和自然灾害风险的所有危险保护差距合计增加了约 6,270 亿美元，达到 1.2 万亿美元，这是有史以来的最高水平。

- The global composite all-peril index improved modestly before the GFC, reaching a peak of 55.9 in 2006, up 1.2 ppt from 2000. Thereafter, the index declined by 2.1 ppt to 2018, reflecting the different trends for the underlying perils.

在全球金融危机爆发之前，全球综合全危指数略有改善，在 2006 年达到 55.9 的峰值，比 2000 年上升了 1.2%。此后，该指数下降了 2.1ppt 至 2018 年，反映了潜在风险的不同趋势。

- Between 2000 and 2018, there were declines in the mortality (–2.5 ppt) and health (–1.1 ppt) indices. The mortality index gained 2 ppt from 2000 to 2007, but this reversed after the GFC.

从 2000 年到 2018 年，死亡率(-2.5ppt)和健康指数(-1.1ppt)都有所下降。死亡率指数从 2000 年到 2007 年上升了 2%，但在全球金融危机之后出现了逆转。

- Property catastrophe I-RI improved marginally (+1.5 ppt).

性质灾难 I-RI 略有改善(+1.5ppt)。

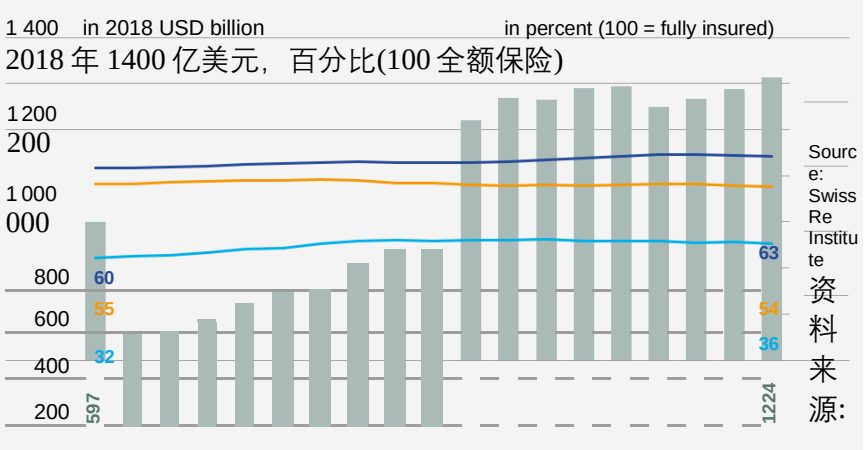
- The decline in the global index over the full time period is a macro phenomenon driven by the faster growth of emerging economies.

全球指数在整个时期的下降是由新兴经济体更快增长驱动的宏观现象。

- The composite I-RIs improved in both the advanced (+3.8 ppt) and emerging economies (+4.5 ppt). However, average I-RIs are lower for emerging economies.

复合 I-RIs 在发达国家(+3.8ppt)和新兴经济体(+4.5ppt)都有所改善。然而，新兴经济体的平均国际收入水平较低。

Figure 12
图 12
The SRI composite all-peril global protection gap and Insurance Resilience Index
Sri 综合全险全球保护差距与保险弹性指数



100
100

80
80

60
60

40
40

20
图 20

0

54 The mortality protection gap is the estimation of a stream of lost income, while natural catastrophe and catastrophic health expenditures mostly relate to short-term expenses; the health I-RI is based on a different benchmark concept leading to a structurally higher level of the I-RIs.

死亡率保护差距是对一系列损失收入的估计，而自然灾害和灾难性保健支出大多与短期支出有关;保健 I-RI 基于一个不同的基准概念，导致 I-RI 在结构上达到更高的水平。

How insurance promotes macro resilience

保险如何促进宏观弹性

Beyond the benefits at the micro level, risk transfer to insurance markets boosts macroeconomic resilience by facilitating stronger recovery after a shock event, and through secondary network effects. In addition, in a different set of modelling, we find that higher insurance penetration is correlated with lower macroeconomic volatility.

除了微观层面的好处之外，向保险市场的风险转移通过促进冲击事件后的强劲复苏和通过次级网络效应，提高了宏观经济的弹性。此外，在另一组模型中，我们发现较高的保险渗透率与较低的宏观经济波动性相关。

We also assess emerging risk pools in commercial insurance, particularly cyber threats, intangible corporate asset risks and business disruption as further opportunities for insurers to build resilience.

我们亦评估商业保险的新兴风险组合，特别是网络威胁、无形企业资产风险和业务混乱，认为这些是保险公司建立抗跌能力的进一步机会。

Individual-level impacts from major risks can accumulate and hit national economic welfare.

重大风险的个体层面影响可能累积并冲击国家经济福利。

Our analysis of micro insurance resilience focuses on the impact of the major perils with potential for catastrophic financial impact – and the related degree of insurance protection – on the welfare of households. The relevance of these perils for the welfare of a country is so significant that in many nations, state programmes cover mortality and particularly health risks, at least to some degree. With respect to natural catastrophe risks, most governments focus on mitigation, while risk transfer is predominantly covered by private (property) insurance markets.

我们对小额保险复原力的分析侧重于具有灾难性金融影响潜力的主要风险以及保险保护的相关程度对家庭福利的影响。这些危险对一个国家福利的重要性如此之大，以至于在许多国家，国家计划至少在一定程度上涵盖死亡率，特别是健康风险。在自然灾害风险方面，大多数政府侧重于减灾，而风险转移主要由私人(财产)保险市场承保。

Insurance funding for reconstruction

重建保险基金

The destruction of productive assets only shows up indirectly as a drop in potential GDP growth.

生产性资产的破坏只是间接地表现为潜在国内生产总值增长的下降。

In this chapter, we focus on the effects of natural catastrophes[55] and insurance cover for related property damage on the economy as a whole. The primary economic effects of a major disaster are the destruction of peoples' assets and firms' capacity to produce. A secondary effect is the temporary disruption of economic activity because of road closures, breakdown in utility services provision, customers' and employees' inability to get to work etc. Both effects are negative, but the destruction of productive assets shows up only indirectly as a drop in potential GDP growth, and is difficult to quantify empirically. Some activity is only postponed (eg, consumption of durable items); some is lost permanently.

在本章中，我们着重讨论自然灾害的影响以及相关财产损失的保险对整个经济的影响。重大灾害的主要经济影响是破坏人民的资产和企业的生产能力。第二个影响是，由于道路关闭、公用事业服务供应中断、顾客和雇员无法上班等原因，经济活动暂时中断。这两种影响都是负面的，但是生产性资产的破坏只是间接地表现为潜在 GDP 增长的下降，并且难以根据经验进行量化。有些活动只是被推迟(例如耐用品的消费)，有些则是永久性的丢失。

In our analysis, the negative effect from disruption outweighs the positive from re-building.

在我们的分析中，破坏带来的负面影响大于重建带来的正面影响。

There is the counterforce of economic activity as measured by GDP getting a temporary boost after the initial destruction and disruption in the months after a natural disaster. This is the statistical reflection of emergency relief efforts and re-building that comes after the disaster. Clean-up, repairs and rebuilding all increase the demand for construction, building supplies and labour. The need to replace flood-damaged cars gives a boost to the sale of new vehicles. Our quantitative analysis suggests that on net, catastrophes reduce GDP growth.

The negative effect from disruption outweighs the positive effects on growth from re-building. These findings are in line with prior research.[56] This body of research generally finds that having insurance increases the likelihood of rebuilding, minimises financial hardship post disaster, and accelerates recovery.

在自然灾害发生后的几个月里，经济活动在经历了最初的破坏和混乱之后，以国内生产总值衡量的经济活动得到了暂时的提振。这是灾后紧急救援和重建工作的统计反映。清理、修理和重建都增加了对建筑、建筑物供应和劳动力的需求。更换被洪水毁坏的汽车的需求促进了新车的销售。我们的定量分析表明，从总体上看，灾难降低了 GDP 的增长。破坏的负面影响大于重建对增长的正面影响。这些研究结果与先前的研究结果一致。56.这一系列研究普遍发现，拥有保险可以增加重建的可能性，最大限度地减少灾后经济困难，并加速复苏。

55 Available data does not allow for similar modeling for the other two perils (mortality and healthcare).

可用数据不允许对其他两个危险(死亡率和医疗保健)进行类似的建模。

56 S. Hsiang, and A. Jina, “The causal effect of environmental catastrophe on long-run economic growth: Evidence from 6 700 cyclones”, *National Bureau of Economic Research Working Paper,* No 20352, 2014.

环境灾难对长期经济增长的因果影响:来自 6700 个气旋的证据，国家经济研究局工作文件，20352,2014。

How insurance promotes macro resilience
保险如何促进宏观弹性

The degree of insurance cover is important for the speed and magnitude of recovery.
保险覆盖的程度对恢复的速度和程度很重要。

The degree of insurance cover is important for the speed and magnitude of recovery. Rebuilding homes and restoring businesses is dependent on funding. Insurance provides a permanent transfer of resources into a recovering region, thereby reducing disruption to economic activity and the financial stress on households and businesses. Without insurance claims payments, rebuilding would need to be financed through other means such as loans or divestment of assets. This in turn would reduce funds available for consumption and investment to the effect of curbing GDP growth in the future. Lack of funding can have a drastic negative impact on the ability to rebuild. This can be seen with the example of New Orleans: 13 years after Hurricane Katrina in 2005, last year the metro area was still around 10% smaller than before the disaster. This is because large numbers of people have chosen not to, or have been unable to return and rebuild.[57]

保险覆盖的程度对恢复的速度和程度很重要。重建家园和恢复商业依赖于资金。保险将资源永久性地转移到恢复区，从而减少对经济活动的干扰以及对家庭和企业的财政压力。如果没有保险索赔支付，重建将需要通过贷款或资产剥离等其他方式筹集资金。这反过来又会减少可用于消费和投资的资金，从而抑制未来国内生产总值的增长。缺乏资金可能对重建能力产生严重的负面影响。这可以从新奥尔良的例子中看出来:2005 年的飓风卡特里娜 13 年后，去年的地铁面积仍然比灾难发生前小了 10%左右。这是因为许多人选择不回去，或者无法回去重建家园

Insurance allows for faster and more efficient reconstructing, and this reduces overall output losses.
保险允许更快和更有效的重建，这减少了整体产出损失。

Because insurance can allow for faster and more efficient reconstruction, overall output losses are reduced. Even if the insurance payout is not immediate, coverage facilitates immediate start of rebuilding if all relevant parties (eg, contractors) know that the money will be forthcoming at some point. This was the case, for example, in New Zealand following the 2010 earthquake in Christchurch, where reconstruction efforts were rapid despite the relatively slow initial insurance payouts due to the complexity of the disbursement system (which ran through the public Earthquake Commission).[58]

因为保险可以使重建工作更快、更有效，所以总体产出损失减少了。即使保险赔偿不是立即支付，如果所有相关方(如承包商)知道资金将在某个时候到来，保险范围便于立即开始重建。例如，2010 年基督城地震之后，新西兰的情况就是如此，尽管由于支付系统的复杂性(通过公共地震委员会)，最初的保险支付相对缓慢，但重建努力仍然迅速

Insurance can also have positive second-order network effects on the local economy.
保险也可以对当地经济产生积极的二阶网络效应。

An expectation of forthcoming insurance payouts for rebuilding can also have a positive second-order impact on economic activity, through network effects. For example, if local business owners in other sectors reasonably foresee their customers rebuilding and returning, they may be more willing themselves to invest after a disaster. Such micro-level decisions add to positive overall macro-level impact.

通过网络效应，对即将到来的重建保险赔偿的预期也可以对经济活动产生积极的二级影响。例如，如果其他部门的当地企业主合理地预见到客户的重建和回归，他们可能会更愿意在灾后进行投资。这种微观层面的决定增加了积极的整体宏观层面的影响。

Our models confirm the positive effect of insurance on recovery through the funding of rebuilding.
我们的模型证实了保险通过重建资金对恢复的积极作用。

Insurance plays a critical role in improving resilience by both promoting recovery and providing incentives for investments in hazard mitigation. Prior research suggests that insurance coverage does improve recovery outcomes but that impact on risk reduction may be modest.[59] We ran various econometric models that confirm the positive effect of insurance on growth/recovery through the funding of rebuild activities (see Figure 13 for a summary of results, and the

The insurance impact is stronger in the emerging than in advanced markets.
与发达市场相比，新兴市场对保险业的影响更大。

Appendix for more details). The positive effect is strongest in the year of the event and still strong and significant in the following year (dynamic resilience). We could not verify the effect in further years given the influence of other macro factors on economic growth, and the winding down of rebuilding activities.

保险业在提高复原力方面发挥了关键作用，既促进复原，又鼓励减灾投资。59.我们运用了各种计量经济学模型，通过为重建活动提供资金，证实了保险对增长/恢复的积极作用(结果摘要见图 13，详情见附录)。正面效应在活动当年最强烈，在次年仍然强烈且显著(动态弹性)。考虑到其他宏观因素对经济增长的影响，以及重建活动的逐步结束，我们无法进一步验证这种影响。

Our findings are complemented by a study by the Bank of International Settlements, which found that major natural catastrophes have a large and significant negative impact on economic activity, driven by uninsured losses. Where sufficiently insured, however, events are inconsequential in terms of foregone output.[60] This impact is particularly evident in low- to middle-income countries, which suffer more when uninsured but recover faster when insured. Our own analysis supports this finding: the positive growth effect from insured losses is stronger for emerging than for advanced economies.[61]

国际清算银行(BankofInternationalSettlements)的一项研究补充了我们的调查结果，该研究发现，重大自然灾害对经济活动具有巨大而重大的负面影响，其驱动因素是未投保的损失。60 这种影响在低收入至中等收入国家尤为明显，这些国家在没有保险的情况下损失更大，但在有保险的情况下恢复得更快。我们自己的分析也支持这一发现:新兴经济体比发达经济体受到保险损失的正增长效应更强

57 US Census Bureau data.

美国人口普查局数据。

58 G. von Peter, S. von Dahlen, S. Saxena, *Unmitigated Disasters? New Evidence on the Macroeconomic Cost of Natural Catastrophes*, Bank for International Settlements Working Paper, 2012.

冯 彼得，s 冯 达伦，s 萨克西纳，《彻底的灾难？自然灾害宏观经济成本的新证据，国际清算银行银行工作文件，2012 年。

59 C. Kousky, 2019, op. cit.

2019，op.cit.

60 G. von Peter, et al, 2012, op. cit.

等人，2012，op.cit。

61 Opposite of result in M. Breckner et al *Economic Development and Resilience to Natural Catastrophes – Insurance Penetration and Institutions – Conference Paper*, 12 February 2016.

《m.Breckner 等人的经济发展和应对自然灾害的复原力——保险普及率和机构——会议文件》，2016 年 2 月 12 日。

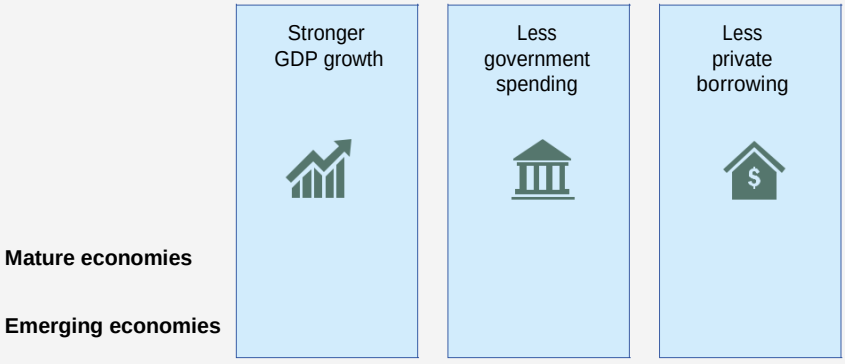
One reason for this is that developed markets have more alternatives to fund rebuilding.
其中一个原因是，发达市场有更多的选择来为重建提供资金。

The weaker statistical evidence for a positive effect from insurance in advanced economies is partly due to the lower average magnitude of catastrophes in relation to the more developed economic activity.[62] It is also because in advanced markets, there are more well-established substitutes to fund re-building (eg, government assistance and better access to credit). Another way insurance contributes to reducing the economic disruption from disasters is by reducing the impact on public finances and lessening the need for private borrowing. Governments often provide financial assistance to households and businesses without sufficient insurance coverage, increasing deficits and constraining fiscal spending in other areas.
发达经济体保险产生积极影响的统计证据较弱，部分原因是与较发达的经济活动相比，灾难的平均规模较低。保险有助于减少灾害造成的经济混乱的另一种方式是减少对公共财政的影响和减少对私人借款的需要。政府往往向没有足够保险覆盖面的家庭和企业提供财政援助，增加赤字，限制其他领域的财政支出。

The impact of insurance as shock absorber is more pronounced in emerging economies given more limited fiscal resources and access to credit.
鉴于财政资源和信贷渠道较为有限，保险作为减震器的影响在新兴经济体更为明显。

Figure 13 provides a summary of insurance coverage effects for catastrophe losses on economic variables.[63] From our data set we conclude that for advanced economies, a higher level of insurance penetration coincides with lower government expenditures post disaster. That is, in countries with high insurance penetration, disasters have smaller real consequences and do not result in deficit expansion. Similarly, advanced economies with higher insurance coverage have lower levels of debt to the private sector in the year after an event. Fiscal resources and access to credit are more limited in many emerging economies, which is why insurance plays a more important role as shock absorber there.[64]
根据我们的数据集，我们得出结论，对于发达经济体来说，更高水平的保险普及率与灾后政府支出的减少是一致的。也就是说，在保险普及率较高的国家，灾害的实际后果较小，不会导致赤字扩大。同样，保险覆盖率较高的发达经济体在事后一年对私营部门的债务水平较低。在许多新兴经济体中，财政资源和获得信贷的机会更为有限，这就是为什么保险在这些国家作为减震器发挥着更重要的作用

Figure 13
图 13
Effect of more insurance coverage for catastrophe losses on economic variables
巨灾损失保险覆盖面扩大对经济变量的影响



Note: indicates strong correlation, weak correlation and no correlation.
注:表示相关性强，相关性弱，无相关性。

Source: Swiss Re Institute
资料来源:瑞士再保险协会

62 On average, catastrophe losses as a share of GDP are much lower for the developed markets in our sample, making it statistically more difficult to find a significant result.

平均而言，在我们的样本中，发达市场的灾难损失占 GDP 的比例要低得多，这使得统计学上更难找到一个有意义的结果。

63 *The Contribution of Reinsurance Markets to Managing Catastrophe Risk*, OECD, 2018.

再保险市场对巨灾风险管理的贡献，OECD，2018。

64 Emerging economies score lower, on average, for the category “fiscal space” in our macroeconomic resilience index.

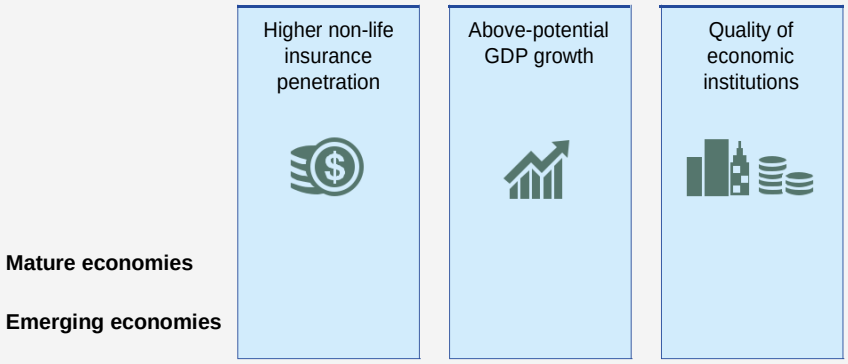
在我们的宏观经济弹性指数中，新兴经济体的“财政空间”得分平均较低。

Higher insurance penetration and lower GDP volatility

Higher insurance penetration is correlated with lower macroeconomic volatility.

Higher insurance penetration is correlated with lower macroeconomic volatility as measured by the standard deviation of GDP. In our econometric modelling, we find a statistically significant negative relationship between non-life insurance penetration and GDP volatility in a panel data set of more than 100 countries.[65] Though the literature on the volatility question is more sparse than that on the question of the insurance impact on growth, this finding agrees with previously published work.[66] In addition to insurance penetration, the quality of economic institutions also matters: the better the institutions, the lower the macroeconomic volatility of a country (see Figure 14).[67] These findings are consistent with inclusion of insurance market penetration, financial market development and other structural elements in our macroeconomic resilience index.[68]

Figure 14
Variables correlated with lower macroeconomic volatility



Note: indicates strong correlation, weak correlation and no correlation.
注:表示相关性强，相关性弱，无相关性。

Source: Swiss Re Institute
资料来源:瑞士再保险协会

There are four transmission mechanisms whereby insurance benefits economic growth.
保险促进经济增长有四种传导机制。

The discussion of how insurance contributes to the resilience of a society builds on prior theoretical and empirical evidence of the economic benefits of insurance, and the transmission mechanisms between insurance and resilience. This research dates back to the 1950s when a solid theoretical understanding of the benefits such as a lesser need for contingency reserves or the role of insurance in "greasing" the credit mechanism was built.[69] As early as 1964, the United Nations Conference on Trade and Development asserted that "a sound national insurance and reinsurance market is an essential characteristic of economic growth."[70] In 1997, Skipper developed the first rigorous framework to show how insurance contributes to economic growth,[71] from which we derive a modified set of four different transmission mechanisms (see Figure 15).
关于保险如何有助于社会复原力的讨论建立在保险经济效益之前的理论和经验证明，以及保险和复原力之间的传递机制的基础上。69 早在 1964 年，联合国贸易和发展会议就断言，"健全的国家保险和再保险市场是经济增长的一个基本特征 701997 年，船长制定了第一个严格的框架，以显示保险如何促进经济增长，71 从中我们得出了一套修改过的四种不同的传导机制(见图 15)。

65 This is driven by a significant impact in emerging economies. When splitting the sample into emerging and developed markets, the impact for developed markets is not significant in some model specifications.

这是新兴经济体受到重大影响的结果。当把样本分成新兴市场和发达市场时，对发达市场的影响在某些模型规范中并不显著。

66 P.M. Sub Choi et al, “Does Insurance Hedge Macro Volatility? Global Evidence” *Investment Management and Financial Innovations*, vol 14, no 2, 2017, pp 307–315.

《保险业对冲宏观波动性吗？全球证据“投资管理和金融创新，第 14 卷，第 2 期，2017 年，307-315 页。

67 A similar result for developed markets was reached by M. Breckner, et. al., 2016, op. cit.

M.Breckner 等人在发达市场也得出了类似的结果。Al2016 年，任务。城市。

68 The remainder of the differences in terms of underlying metrics used between that index and the analysis here is due to the more limited availability of data for the larger panel data set used in this section.

该索引与本文分析之间使用的基本衡量标准方面的其余差异，是由于本节使用的较大面板数据集的数据可用性较为有限。

69 R. Lester, *Insurance and Inclusive Growth: Policy Research Working Paper 6943*, World Bank, 2014.

保险与包容性增长:政策研究工作文件 6943，世界银行，2014。

70 Quoted in H. Skipper, *Foreign insurers in emerging markets: Issues and concerns,* International Insurance Foundation, 1997.

《新兴市场的外国保险公司:问题和关注》，国际保险基金会，1997 年。

71 Ibid

同上

The aggregate of micro-level insurance decisions make the overall economy more resilient.
微观层面的保险决策总量使整体经济更具弹性。

First, insurers enhance the efficiency of risk management through risk pricing, transformation and pooling. This includes risk management in the corporate sector, where commercial insurance helps firms better withstand external shocks (see *Commercial insurance: No index, but integral to global resilience*). Ex-ante risk management enables entrepreneurship and supports more efficient resource allocation. Through ex-post financial protection, insurance accelerates recovery. These micro-level impacts aggregate to build overall economic resilience.
首先，保险公司通过风险定价、转化和汇集，提高了风险管理的效率。这包括企业部门的风险管理，其中商业保险有助于企业更好地抵御外部冲击(见商业保险:没有指数，但对全球复原力至关重要)。事前风险管理能够促进企业家精神，并支持更有效的资源分配。通过事后金融保护，保险业加速复苏。这些微观层面的影响汇总起来，形成总体经济弹性。

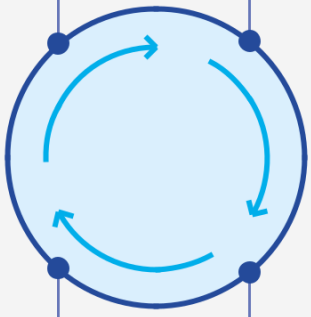
Insurers are long-term investors, which adds to financial stability.
保险公司是长期投资者，这增加了金融稳定性。

Second, insurance promotes financial stability by providing a stable source of long-term capital. Life insurers in particular are long-term institutional investors, a role that is important in stabilising financial markets and improving macro resilience. Insurers are able to do this because of their illiquid liabilities (there can be no run on insurers in the same way there can be a run on banks) and low capital leverage.
其次，保险通过提供稳定的长期资本来源，促进金融稳定。人寿保险公司尤其是长期机构投资者，在稳定金融市场和提高宏观抵御能力方面发挥着重要作用。保险公司之所以能够做到这一点，是因为它们的流动性不足的负债(保险公司不会像银行挤兑那样出现挤兑)和资本杠杆率低。

Private insurance can substitute for government spending, relieving fiscal stress.
私人保险可以替代政府支出，缓解财政压力。

Third, private insurance can complement or even substitute for government programmes, reducing the burden on taxpayers. In the US, for example, insurance payments from annuities and disability policies represent about 20% of total Social Security payments and private health insurers cover 35% of total healthcare expenditures.[72] The relief offered by insurers is of particular relevance to fiscally-stressed governments, provided prudential regulation ensures the performance of the insurance sector during times of external shock.
第三，私人保险可以补充甚至替代政府计划，减轻纳税人的负担。例如，在美国，来自年金和残疾保单的保险付款约占社会保障付款总额的 20%，而私营医疗保险公司则占医疗保健支出总额的 35%。72 保险公司提供的救助对财政紧张的政府尤其重要，前提是审慎监管要确保保险公司在外部冲击时的表现。

Figure 15
图 15
How insurance benefits macro resilience of societies
保险如何有利于社会的宏观弹性



Efficient risk management
有效的风险管理

Frees up capital
释放资本

Increases the capacity to withstand less or uninsured shocks
提高承受较少或无保险冲击的能力

减轻财政紧张政府的负担

Requires prudential regulation
需要谨慎的监管

Substitute for government programs
取代政府计划

Reducing the burden on fiscally stressed governments

Stable growth,
稳定增长
income and
收入及
consumption
消费

Financial stability
减少金融稳定性损失

Long-term assets and liabilities
Stable source of capital
长期资产和负债稳定
资本来源

Low levels of leverage
低杠杆率

Stabilising role in the financial system
金融体系的稳定作用

Loss mitigation

Financial incentives, underwriting criteria
Data and risk management expertise
财务激励，承保标准数据和
风险管理专业知识

Promotion of best practice loss prevention measures
促进最佳做法防止损失措施

Source: Swiss Re Institute
资料来源:瑞士再保险协会

Insurance also incentivises best practice in loss mitigation.
最后，再保险公司提供经济奖励以减少损失减少损失的实践。保单持有人和整个社会的利益。保险可以提供财政支持

Lastly, re/insurers provide economic incentives to facilitate loss mitigation, benefiting policyholders and society at large. Insurance can provide financial incentives and risk management expertise that promote best practice loss prevention measures, such as building standards and fire protection. In catastrophe scenarios, the aggregate level of individual mitigation measures becomes part of static resilience on a macro level.
鼓励措施和风险管理专业知识，促进最佳实践损失预防措施，如建筑标准和防火。在灾难情景下，个别缓解措施的总体水平成为宏观层面上静态复原力的一部分。

72 Data from US Department of Health and Human Services, and Centers for Medicare & Medicaid Services; calculations by Swiss Re Institute.
72 数据来自美国卫生与公众服务部和医疗保险与医疗补助中心服务;瑞士再保险协会的计算。

Commercial insurance: no index, but integral to global resilience
商业保险:不是指数，而是全球韧性的组成部分

The commercial sector is also a key component of the overall resilience equation.
商业部门也是整个弹性方程式的一个关键组成部分。

The SRI Insurance Resilience Indices are based more on personal lines insurance for households. Another area of insurance opportunity is protection for the risk exposures that businesses face in their commercial activities. These risks are diverse, complex and difficult to model for the purposes of an index, and we make no attempt to do so in this *sigma*. Instead, we provide here a qualitative overview of the commercial insurance sector, which today is a USD-800-billion global premium market. The sector is a key component of the overall resilience equation and an opportunity that will grow as new exposures emerge.
社会责任投资保险韧性指数更多地基于家庭的个人保险。保险机会的另一个领域是保护企业在其商业活动中面临的风险。这些风险是多样的，复杂的，难以为一个指数的目的建模，我们没有尝试这样做在本西格玛。相反，我们在这里提供了一个商业保险部门的定性概述，今天是一个 8000 亿美元的全球保费市场。该板块是整体弹性方程式的一个关键组成部分，随着新风险敞口的出现，机会也会增加。

Corporate risk transfer reduces the costs associated with financial distress.
企业风险转移降低了与财务困境相关的成本。

A main motivation for risk transfer by corporates is access to funds when they need it most, reducing the risks of bankruptcy and costs associated with financial distress.[73] These financial distress costs include poorer terms on future loans; strained relationships with suppliers and clients; departure of key personnel, or a need to pay a high retention wage; and a fall in the company's stock price, which limits the ability to withstand other external shocks. Companies also buy commercial insurance to cover traditional property and liability risks. With the digital transformation of life, new areas of protection gap in business have emerged. Here commercial insurance, with innovative solutions, can help build corporate and de facto socio-economic resilience. Here we look at the opportunities in three areas of emerging risks.
企业进行风险转移的一个主要动机是在最需要资金的时候获得资金，从而降低破产风险和与财务困境相关的成本。这些财务困境成本包括:未来贷款条件较差;与供应商和客户的关系紧张;关键人员离职，或者需要支付高额保留工资;以及公司股价下跌，这限制了公司抵御其他外部冲击的能力。公司还购买商业保险，以覆盖传统的财产和责任风险。随着生活的数字化转型，商业领域出现了新的保护差距。在这里，商业保险，以及创新的解决方案，可以帮助建立企业和事实上的社会经济弹性。在这里，我们来看看新出现风险的三个领域的机会。

Despite increasing efforts of securing networks, exposure to cyberattacks is growing.
尽管加强网络安全的努力越来越多，但遭受网络攻击的风险却越来越大。

Cyber risk: Digitisation is contributing increasingly more to global wealth creation. As a flipside, cyber risk is rising rapidly too. The latest "economic impact of cybercrime" study calculates the global cost of cybercrime to have been 0.6% to 0.8% of global GDP in 2017, or USD 445–608 billion.74 This encompasses direct losses due to cyber-crime, the cost of securing networks, "reputational damage and liability risk for the hacked company and its brand", opportunity costs, and the cost of associated insurance. Separately, the latest Cambridge Global Risk Index ranks cyber at 6th among key risks, with an annual loss estimate of USD 40 billion for the aggregate of large 279 cities, which account together for 41% of global GDP. 75 This suggests a global loss estimate of less than USD 100 billion if we assume a smaller per-GDP exposure for the rest of the world.
网络风险:数字化对全球财富创造的贡献越来越大。另一方面，网络风险也在迅速上升。最新的"网络犯罪的经济影响"研究估计，2017 年全球网络犯罪的成本占全球国内生产总值的 0.6%至 0.8%，即 4,450-6,080 亿美元。74 这包括网络犯罪造成的直接损失、网

络安全成本、“被黑客攻击的公司及其品牌的声誉损害和责任风险”、机会成本以及相关保险成本。另外，最新的剑桥全球风险指数将网络风险排在关键风险的第 6 位，对 279 个大城市的年度损失估计为 400 亿美元，这些城市总共占全球 GDP 的 41%。75 这表明，如果我们假设世界其他地区的人均国内生产总值风险较小，全球损失估计不到 1,000 亿美元。

73 K. A. Froot, D. S. Scharfstein and J. C. Stein, “Risk management: Coordinating corporate investment and financing policies”, *Journal of Finance,* vol 48, no 5 1993, pp 1629–1658; B. Caillaud, G. Dionne and B. Jullien, “Corporate insurance with optimal financial contracting”, *Economic Theory,* vol 16, no 1 2000, pp 77–105.

K. a. Froot，d. s. Scharfstein and j. c. Stein，“ Risk management: Coordinating Corporate investment and financing policies”，Journal of Finance，vol 48，no 51993，pp 1629-1658; b. Caillaud，g. Dionne and b. Jullien，“ Corporate insurance with optimal financial contracting”，Economic Theory，vol 16，no 12000，pp 77-105。

74 Economic impact of cybercrime – no slowing down, Center for Strategic and International Studies (CSIS), February 2018.

战略与国际研究中心，2018 年 2 月。

75 Cambridge Centre for Risk Studies, op. cit.

剑桥风险研究中心。

A large systemic cyber risk event could generate huge losses, mostly uninsured.
一次大规模的系统性网络风险事件可能会造成巨额损失，其中大部分都没有保险。

Among the major cyber risks are a large data breach and a catastrophic event like outage of a major cloud service provider, or a global malware event. A recent study analyses the cloud as a source of systemic risk. It estimates a cyber incident that takes a top three cloud provider in the US down for 3–6 days would result in total losses of USD 6.9–14.7 billion. The associated insurance losses, however would be just USD 1.5–2.8 billion: in other words, around 80% of the losses would be uninsured.[76] Another study estimates that a wide-reaching malware event would generate insurance losses of USD 10–27 billion, just 9–14% of the total losses.[77]

主要的网络风险包括大量数据泄露和灾难性事件，如主要云服务提供商的中断，或全球恶意软件事件。最近的一项研究分析了云是系统性风险的一个来源。据估计，如果一起网络事件导致美国三大云服务提供商瘫痪 3-6 天，总损失将达到 69-147 亿美元。然而，相关的保险损失只有 15-28 亿美元:换句话说，大约 80%的损失没有保险。另一项研究估计，一个广泛的恶意软件事件将产生 100-270 亿美元的保险损失，仅占总损失的 9-14%

The cyber insurance market is still small, but is set to grow rapidly.
网络保险市场规模仍然很小，但将迅速增长。

With a growing catalogue of cyber incidents and increasing exposures, there is high demand for associated insurance solutions. Even so, the stand-alone cyber market is still comparably small, with global premium income estimated to be around USD 4.5 billion in 2017, of which the US accounted for 80–90% and the EU for 5–9%.[78] This market segment is set for solid double-digit growth for the next five to 10 years and is forecast to reach USD 20–25 billion by 2025.[79]

随着越来越多的网络事件和风险暴露，有很高的需求相关的保险解决方案。即便如此，独立的网络市场仍然相当小，2017 年全球保费收入估计约为 45 亿美元，其中美国占 80-90%，欧盟占 5-9%。78 这一市场部分在未来 5-10 年将实现稳健的两位数增长，预计到 2025 年将达到 200-250 亿美元

The nature of value creation in business has moved on from the production of physical assets.
企业价值创造的本质已经从有形资产的生产转移到有形资产的生产。

Exposures stemming from intangible business value: Today the value of firms derives mostly from intangible assets such as intellectual property, networks, platforms, data and customer relationships. As companies have shifted from making physical things to providing information and services, the composition of companies' balance sheets has shifted too. Tangible assets like property, plants and equipment (PPE) currently account for 19% of the enterprise value of the non-financial S&P 500 companies. In 1995, the share was at around 48%.[80]

来自无形商业价值的风险暴露:今天，企业的价值主要来自无形资产，如知识产权、网络、平台、数据和客户关系。随着企业从生产实体产品转向提供信息和服务，企业资产负债表的构成也发生了变化。财产、厂房和设备(PPE)等有形资产目前占标准普尔 500 指数非金融类公司企业价值的 19%。1995 年，这一比例约为 48%

The rising value of intangibles is leading to increased demand for insurance solutions for risks that were previously considered uninsurable.
无形资产的价值不断增加，导致对以前被认为无法保险的风险的保险解决方案的需求增加。

In a study this year, the Ponemon Institute estimates the total value of corporate intangibles in the US to be USD 20–25 trillion.[81] Globally, we roughly estimate double that size. The same study also says companies value information assets 12% higher than PP&E assets, and estimates probable maximum losses from intangibles 35% higher than from tangibles. Extent of insurance cover, however, is much lower: on average, 16% for intangibles versus 60% cover for PP&E assets.

在今年的一项研究中，波耐蒙研究所估计美国企业无形资产的总价值为 20-25 万亿美元。同一项研究还表明，企业对信息资产的估值比 pp&e 资产高出 12%，并估计无形资产可能造成的最大损失比有形资产高出 35%。然而，保险的覆盖范围要低得多:无形资产的平均覆盖率为 16%，而 pp&e 资产的覆盖率为 60%。

As “intangibles” business value grows, demand for insurance solutions is moving to protection for business risks that were previously uninsurable like earnings and cash flow losses. Sources of these losses include cyber, business disruption, product recall, reputation, weather and commodity price risks. Most innovative insurance solutions are currently custom-made and include the use of parametric triggers, double triggers and structured solutions. All these new areas of risk transfer require modelling or underwriting expertise, which is enabled by the growth in data and advanced data analytics. With digital transformation, the opportunity is to develop innovative solutions into mainstream products, and thus further close protection gaps.

随着“无形资产”业务价值的增长，对保险解决方案的需求正在转向保护以前无法保险的业务风险，如收益和现金流损失。这些损失的来源包括网络、商业中断、产品召回、声誉、天气和商品价格风险。大多数创新的保险解决方案目前是定制的，包括使用参数触发器，双触发器和结构化解决方案。所有这些风险转移的新领域都需要建模或承销专业知识，而数据和先进数据分析的增长使这一专业知识成为可能。随着数字化转型，机会是开发创新的解决方案成为主流产品，从而进一步缩小保护差距。

76 *Cloud Down: Impacts on the US economy,* Lloyd’s and AIR Worldwide, January 2018.
阴云密布:对美国经济的影响，劳埃德船级社和 AIRWorldwide，2018 年 1 月。

77 *Bashe attack: Global infection by contagious malware*, Cambridge Centre for Risk Studies, Lloyd’s of London and Nanyang Technological University, 2019.
巴什攻击:传染性恶意软件的全球感染，剑桥风险研究中心，伦敦劳埃德和南洋理工大学，2019 年。

78 EU-U.S. INSURANCE DIALOGUE PROJECT – the cyber insurance market, European Insurance and Occupational Pensions Authority, October 2018.
欧洲保险和职业养老金管理局，2018 年 10 月。

79 An internet search reveals a number of studies and projections by insurance companies and brokers which foresee compound average growth rates of between 25 and 35% for this segment.
互联网搜索显示，保险公司和经纪人进行了大量研究和预测，预测这一部分的复合平均增长率将在 25%至 35%之间。

80 Swiss Re Institute calculations, based on data from Bloomberg.
瑞士再保险研究所的计算，基于彭博社的数据。

81 *2019 Intangible Assets Financial Statement Impact Comparison Report,* Ponemon Institute, 2019.
2019 年无形资产财务报表影响比较报告，波耐蒙研究所，2019 年。

With more complex value chains, demand for business interruption risk covers has also grown.
随着价值链越来越复杂，对业务中断风险保障的需求也在增长。

More and more, commercial insurance demand has detached from asset-related property risks.
商业保险需求越来越远离资产相关的财产风险。

Business interruption: Globalisation has resulted in more complex value chains, with many companies now connected to a number of suppliers across the world. This has increased firms' focus on business interruption (BI) risk. Almost all large property insurance claims now include a major BI element, and these typically account for a majority of the loss.[82] Alongside standard BI insurance, which is triggered in the event of an insured's own-property losses when business is disrupted, there has also been growth in demand for contingent business interruption (CBI) insurance, which covers for property losses at an external party such as a supplier that result in a business disruption for the policyholder even without own-property loss.[83]

业务中断:全球化导致了更加复杂的价值链，许多公司现在与世界各地的许多供应商建立了联系。这增加了公司对商业中断风险的关注。82.除了标准的商业生意保险外，对或有业务中断(CBI)保险的需求也有所增长，这种保险包括外部方面的财产损失，例如供应商的财产损失，即使投保人没有自有财产损失也会导致业务中断

The next stage in the evolution of innovative insurance products is the development of non-physical damage business interruption (NDBI) covers, in some cases called "named-peril earnings insurance". Here the insured risk is detached from asset-related property risk, as the cover protects earnings even absent physical damage at an insured's own or a third-party property. Examples of NDBI events include electricity blackouts, strikes, government actions like a withdrawal of regulatory approval or product license, and bankruptcy at a key supplier. According to the annual *Allianz Risk Barometer*, BI ranks as the biggest risk facing business for the seventh year in a row. Within BI, cyber ranked as the main concern.[84] The potential market for business continuity risks is huge, making this another area where insurers can make the global economy more resilient.

创新型保险产品发展的下一个阶段是非物质损害赔偿业务中断(NDBI)的发展，在某些情况下被称为"命名危险收益保险"。在这种情况下，被保险的风险与资产相关的财产风险分离，因为即使在被保险人自己或第三方财产没有实际损害的情况下，保险范围也保护收益。Ndbi 事件的例子包括停电，罢工，政府行动，如撤销监管批准或产品许可证，和破产的关键供应商。根据一年一度的安联风险晴雨表，BI 连续第七年被列为最大的风险企业。84 业务连续性风险的潜在市场是巨大的，这是保险公司可以使全球经济更具弹性的另一个领域。

82 According to the analysis of large claims (>EUR 100 million) by Allianz Global Corporate & Specialty, BI accounts for 58% of the claims costs. See *Global Claims Review – 2018,* Allianz Global Corporate & Specialty, 2018.

根据安联全球企业和专业公司对大额索赔(1 亿欧元)的分析，BI 占索赔费用的 58%。参见 2018 年全球索赔回顾，安联全球企业与专业，2018 年。

83 Covers for BI were already developed at the beginning of the 19th century; see *History of Business Interruption Insurance*, LMI Group.

Bi 的封面早在 19 世纪初就已经开发出来了;参见 LMIGroup。

84 *Allianz Risk Barometer: Top Business Risks 2019*, Allianz Global Corporate & Specialty, 2019.

安联风险晴雨表:2019 年顶级商业风险，安联全球企业与专业，2019 年。

Capturing the full potential of insurance

抓住保险的全部潜力

In terms of total expected insurance claims payments, we estimate the untapped resilience potential from the three (micro) risk areas in focus to be more than USD 1 trillion per year. To fully capture this potential, a number of supply and demand side barriers to increase uptake of insurance need to be overcome. These include economic factors, financial and institutional developments, and risk and insurance perceptions. They need to be addressed through cooperation among multiple stakeholders.

就预期的保险索赔付款总额而言，我们估计重点三个(微观)风险领域尚未开发的弹性潜力每年超过 1 万亿美元。为了充分发挥这一潜力，需要克服一些供求方面的障碍，以增加对保险的吸收。这些因素包括经济因素、金融和制度发展，以及对风险和保险的看法。需要通过多个利益攸关方之间的合作来解决这些问题。

The untapped resilience potential: > USD 1 trillion

未开发的弹性潜力:1 万亿美元

The global protection gaps in premium equivalent terms add up to more than USD 1.2 trillion…

保险费等值的全球保护缺口加起来超过 1.2 万亿美元..。

The estimated global protection gaps in 2018 premium equivalent terms for the three areas in focus at the micro level of this study were USD 222 billion for natural catastrophe perils, USD 386 billion for mortality risks, and USD 616 billion for healthcare spending risks. As these estimates capture only three areas, we can assume the combined more-than USD 1.2 trillion gap represents the lower bound of total untapped risk pools in the world today. For example, the large protection gaps for motor and general property risks in emerging economies, which we have not quantified due to a lack of data, are not included. Nor are known and emerging risks pools such as business interruption and cyber threats.

2018 年，本研究微观层面三个重点领域的全球保护差距估计为:自然灾害风险为 2,220 亿美元，死亡风险为 3,860 亿美元，保健开支风险为 6,160 亿美元。由于这些估计只涵盖了三个领域，我们可以假定，总共超过 1.2 万亿美元的缺口代表了当今世界未开发风险资金总量的下限。例如，新兴经济体对汽车和一般财产风险的巨大保护缺口没有包括在内，由于缺乏数据，我们尚未对这些缺口进行量化。业务中断和网络威胁等已知和新出现的风险池也不存在。

…and yield an annual profit opportunity for the insurance industry of USD 60-80 billion.

每年为保险业带来 600-800 亿美元的盈利机会。

As Table 4 shows, we estimate that closing the coverage gaps for the three main areas in focus would improve global financial resilience by increasing the average expected claims payments to cover for insured events by more than USD 1 trillion per year.[85] Closing the protection gap is a significant premium growth and profitability opportunity for the insurers too. Based on conservative assumptions of industry profit margins, our model estimates that the business volume needed to close these gaps represents an additional profit opportunity of between USD 60–80 billion per year for the insurance sector as a whole.

如表 4 所示，我们估计，缩小三个主要重点领域的保险差距将提高全球金融抗御能力，每年为保险事件提供的平均预期索赔额将增加 1 万亿美元以上。根据对行业利润率的保守假设，我们的模型估计，弥补这些差距所需的业务量意味着整个保险部门每年有 600 亿至 800 亿美元的额外利润机会。

The largest untapped profit margin is in natural catastrophe insurance.

最大的未开发利润空间是自然灾害保险。

The assumed profit margin is highest in the natural catastrophe sector due to higher capital costs, followed by mortality and health. For the global P&C insurance industry, closing the natural catastrophe protection gap would bring around

由于资本成本较高，自然灾害部门的假设利润率最高，其次是死亡率和健康状况。对于全球 p&c 保险业来说，缩小自然灾害保护差距将带来巨大的经济效益

USD 20–24 billion in additional profit, equivalent to 20% of the 2018 profit pool. Our estimate is based on a 56% increase in property premiums, with a corresponding increase of the industry profit pool. For L&H, we estimate that closing the mortality and health protection gaps would increase premium volumes and profit pools by around 14% in life and by 46% in health insurance.

200-240 亿美元的额外利润，相当于 2018 年利润池的 20%。我们的估计是基于房地产保费 56%的增长，以及行业利润池的相应增长。对于 l&h 公司，我们估计，缩小死亡率和健康保护的差距，将使寿险保费和利润总额分别增加约 14%和 46%。

Table 4
Global protection gaps in 2018 (in terms of USD billion premium equivalent), and profit margins and pools

	Natural catastrophe	Mortality	Health
Protection gap 2018, USD bn	222	386	616
As % of current premiums[86]	56	14	46
Additional claim payments, USD bn	177	309	560
Assumed profit margin, % of premiums	9–11	5–7	3–5
Additional profit potential, USD bn	20–24	19–27	18–31

Source: Swiss Re Institute

资料来源:瑞士再保险协会

85 The USD 1 trillion figure is derived by adding up the additional claims payments from Table 4. The claims payments are estimated based on the protection gap in premium terms and an assumed typical expense ratio.

1 万亿美元数字是将表 4 中的额外索赔付款加起来得出的。索赔付款是根据保费差额和假定的典型费用比率估算的。

86 For natural catastrophes, we compare the protection gap with total property premiums, for mortality with total life premiums including savings products.

对于自然灾害，我们比较保护差距与总财产保险费，死亡率与总寿命保险费包括储蓄产品。

Capturing the full potential of insurance
抓住保险的全部潜力

A number of barriers hold back take up of insurance and contribute to the untapped resilience gaps.
一些障碍阻碍了保险业的发展，并有助于填补尚未开发的复原力空白。

Filling the untapped resilience gaps and accessing the profit potential requires an increase in the global uptake of insurance. Numerous supply and demand barriers currently hold back consumer uptake and prevent insurance from fully contributing to economic resilience at both the micro and macro levels (see *Reasons people don't buy insurance*). Recent research provides useful insights on these barriers, which need to be tackled by cooperation between multiple stakeholders: governments, regulators, insurers, individuals and businesses.
要填补尚未开发的复原力空白并获取利润潜力，就需要增加全球对保险的接受。目前，众多的供求障碍阻碍了消费者的消费，并阻碍了保险业在微观和宏观层面对经济弹性的充分贡献(见人们不购买保险的原因)。最近的研究为解决这些障碍提供了有用的见解，这些障碍需要通过多方利益相关者的合作来解决:政府、监管机构、保险公司、个人和企业。

Reasons people don't buy insurance
人们不买保险的原因

A number of supply and demand side barriers hold back greater uptake of insurance.
一些供需方面的障碍阻碍了保险业的进一步发展。

Too-high cost is a main reason for underinsurance.
成本过高是保险不足的一个主要原因。

Economic factors: Affordability is a main reason for underinsurance, particularly for lower-income households and small and medium-sized firms. For example, research on the impact of hurricane Katrina in New Orleans shows that neighbourhoods with high poverty levels also had low flood insurance penetration.[87] On the supply side, traditional insurance contracts cannot be scaled down efficiently for lower-income customers due to transaction costs. This is where innovative, cost efficient products are necessary to open up risk transfer for underserved markets.
经济因素:负担能力是保险不足的一个主要原因，特别是对低收入家庭和中小型企业而言。例如，对新奥尔良飓风卡特里娜保险影响的研究表明，贫困程度高的社区洪水保险渗透率也低。这就是需要创新的、具有成本效益的产品为服务不足的市场开放风险转移的地方。

Access to a well-functioning financial sector increases insurance penetration.
获得运作良好的金融部门提高了保险普及率。

Financial and institutional developments: The degree of financial sector development strongly affects insurance penetration. The insurance industry is highly interdependent with financial markets, and a well-functioning banking system increases consumer confidence in financial transactions.[88] We find that access to the formal financial sector is correlated with insurance penetration.[89] Credit drives the financing of insurable assets. And credit itself may require insurance to protect collateral, such as when property insurance is needed for mortgages. Policies that promote financial inclusion therefore may also benefit insurance penetration.
金融和制度发展:金融部门的发展程度强烈影响保险渗透。保险业与金融市场高度相互依存，运作良好的银行系统增强了消费者对金融交易的信心。我们发现，进入正规金融部门的机会与保险渗透率相关。而信贷本身可能需要保险来保护抵押品，比如抵押贷款需要财产保险。因此，促进普惠金融保险的政策也有利于保险的普及。

Weak property rights and corruption may reduce demand.
产权薄弱和腐败可能会减少需求。

Weak property rights, often prevalent in emerging economies in particular, may limit insurance demand for property insurance. Homes may be uninsurable without legal title or official recognition. Corruption and political risk may reduce insurance demand given uncertainty regarding the enforcement of insurance contracts.
产权薄弱，尤其是在新兴经济体中普遍存在，可能会限制对财产保险的需求。如果没有合法的所有权或官方承认，房屋可能是不

Insurance market competitiveness can affect product attractiveness.
保险市场的竞争力会影响产品的吸引力。

可保的。由于保险合同执行的不确定性，腐败和政治风险可能会减少保险需求。

The competitiveness of insurance markets can further affect product attractiveness for consumers. Open markets and the presence of foreign competitors often increases competition and insurance product variety, which helps boost penetration.

A supportive regulatory environment bolsters the development of the industry while protecting customers and promoting trust in insurance products. The opposite is the case for closed markets with weak regulations.

保险市场的竞争力会进一步影响产品对消费者的吸引力。开放的市场和外国竞争者的存在往往增加了竞争和保险产品的多样性，这有助于提高渗透。一个有利的监管环境支持保险业的发展，同时保护客户和促进对保险产品的信任。相反，监管薄弱的封闭市场的情况正好相反。

87 M. Masozera, M. Bailey, and C. Kerchner. “Distribution of impacts of natural disasters across income groups: A case study of New Orleans.” *Ecological Economics 63,* 2007.

马索泽拉先生、贝利先生和克什内尔先生。“自然灾害对收入群体的影响分布:以新奥尔良为例。”生态经济学 63,2007。

88 See chapter 3 of this *sigma* for more on the relevance of category “financial market development” contributing to the SRI-LSE Macroeconomic Resilience Index.

有关“金融市场发展”类别对 SRI-LSE 宏观经济复原力指数贡献的相关性，请参阅本标准差第 3 章。

89 Holzheu, Thomas, and Ginger Turner. “The natural catastrophe protection gap: Measurement, root causes and ways of addressing underinsurance for extreme events.” *The Geneva Papers on Risk and Insurance-Issues and Practice* 43(1), (2018): pp. 37–71.

霍尔热、托马斯和金吉尔 特纳。自然灾害保护缺口:极端事件保险不足的度量、根源和解决办法日内瓦风险与保险文件-问题与实践 43(1)，(2018):第 37-71 页。

Behavioural factors can lead to under-insurance, in particular for low-probability, high-loss events.
行为因素可能导致保险不足，特别是对于低概率、高损失的事件。

Trust and risk perceptions: Behavioural research indicates that people make choices contrary to expected utility theory and take a heuristic approach in their decision making. Also, people often under-estimate the risk of low-probability, high loss events such as natural catastrophes, and often fail to purchase related insurance cover even when it is offered at favourable premiums.[90] One reason for this is lack of experience with rare events. On the other hand, consumers are likely to over-insure to minimise out-of-pocket costs[91] and for high-probability, low-consequence risks.[92]

信任和风险感知:行为研究表明，人们做出的选择与预期效用理论相反，并在他们的决策采取启发式方法。此外，人们往往低估了发生自然灾害等低概率、高损失事件的风险，而且往往不购买相关的保险，即使保费优惠。另一方面，消费者可能会过度投保，以尽量减少自付费用 91 和高概率、低后果风险

Misperceptions around the role of government in post-disaster assistance also play a role.
对政府在灾后援助中作用的误解也起到了一定作用。

Many households do not fully understand the cover provided by their insurance policies. There is also misperception about the availability of government post-disaster assistance. Most individuals expect some form of state funding after occurrence of a disaster event. However, the majority of federal post-disaster assistance goes to emergency relief services and rebuilding public infrastructure, rather than to compensate household and business losses.

许多家庭并不完全了解他们的保险政策所提供的保障。人们对政府灾后援助的可用性也存在误解。大多数人希望在发生灾害事件后得到某种形式的国家资助。然而，联邦灾后援助的大部分用于紧急救援服务和重建公共基础设施，而不是补偿家庭和企业的损失。

Limited financial literacy and trust in insurance holds back uptake…
有限的金融知识和对保险业的信任阻碍了人们的发展。

Financial literacy and consumer education about insurance are critical to increase uptake. Insurance is an abstract product that often requires customised explanation. In emerging economies in particular, many potential customers have no experience of insurance. For example, the experience of a large microinsurance provider that operates in Africa and Asia shows that three quarters (75%) of customers never had insurance before.[93] Uptake is also dependent on trust that an insurer will pay claims. Research suggests that lack of trust holds back insurance purchases, particularly among low income and risk-averse households which stand to benefit most.[94]

金融知识和有关保险的消费者教育对于提高保险业务的普及率至关重要。保险是一种抽象的产品，通常需要定制的说明。特别是在新兴经济体，许多潜在客户没有保险经验。例如，一家在非洲和亚洲开展业务的大型微型保险公司的经验表明，四分之三(75%)的客户以前从未购买过保险。研究表明，缺乏信任阻碍了保险购买，尤其是在低收入和规避风险的家庭中，这些家庭将获益最多。94

…while easier purchasing processes encourage buyers.
...而更简单的购买程序鼓励买家。

Ease of purchase may also impact insurance buying behaviour. In a global survey, 50% of consumers reported buying insurance policies based on cost. However, nearly 30% reported that frequency of communication with their insurer was an important factor, and 30% cited the quality of service.[95]

购买方便程度也可能影响保险购买行为。在一项全球调查中，50%的消费者报告说他们购买了基于成本的保险。然而，近 30%的受访者表示，与保险公司沟通的频率是一个重要因素，30%的受访者表示服务质量是重要因素

的损失?”28(1)，2004，pp.5-21.

91 N. Kettlewell, “Policy choice and product bundling in a complicated health insurance market: Do people get it right?” *Journal of Human Resources*, 2018.

复杂的医疗保险市场中的政策选择和绑售:人们做得对吗人力资源杂志，2018。

92 M. Browne, C. Knoller and A. Richter. “Behavioral bias and the demand for bicycle and flood insurance”, *Journal of Risk and Uncertainty* 50.2, 2015, pp. 141–160.

布朗、克诺勒和里希特。“行为偏差与自行车和洪水保险的需求”，《风险与不确定性杂志》50.2,2015，第 141-160 页。

93 Interview with Bima’s deputy CEO Mathilda Strom. I. Lundgren, “Bima raises $97M from Allianz for microinsurance aimed at emerging markets”, *techcrunch.com,* 19 December, 2017.

采访比玛的副首席执行官玛蒂尔达 斯特罗姆。I.Lundgren，“Bima 从安联集资 9700 万美元，用于针对新兴市场的小额保险”，2017 年 12 月 19 日。

94 S. Dercon, J. Gunning, and A. Zeitlin, *The demand for insurance under limited trust: Evidence from a field experiment in Kenya – Working Paper,* 2015.

在有限的信任下对保险的需求:来自肯尼亚现场实验的证据-工作文件，2015 年。

95 *Global Consumer Insurance Survey,* Ernst & Young, 2014.

全球消费者保险调查，安永会计师事务所，2014。

90 H. Kunreuther, and M. Pauly, “Neglecting Disaster: Why Don’t People Insure Against Large Losses?” *Journal of Risk and Uncertainty* 28(1), 2004, pp. 5–21.

孔鲁瑟和保利:“忽视灾害:为什么人们不投保对大

Boosting uptake of insurance
促进保险业的发展

Reducing or eliminating the above-discussed barriers to insurance take-up is key to closing protection gaps. This will require specific measures by insurers and governments to change buying behaviours and market structures.
减少或消除上述保险承保障碍是缩小保护差距的关键。这需要保险公司和政府采取具体措施，改变购买行为和市场结构。

Product innovation can extend industry reach to underserved markets and new areas of insurability.
产品创新可以将产业延伸到服务不足的市场和可保险的新领域。

Product and process innovation
产品和工艺创新

Technology and digitisation can enable advanced, customised and more efficient products and underwriting methods (eg, usage-based insurance, wearables, smart home devices), expand distribution channels (online sales) and improve claims settlement (eg, self-claim video and photos). Some insurers have started using advanced data analytics to obtain deeper insight into the risks covered, thus helping with the submission and claim processes, and allowing insurers to offer individualised quotes. By fostering trust between policyholder and insurer, blockchain can be used to increase transparency and speed up payment of claims. Coverage can also be broadened by the development of innovative index-based coverages and different types of parametric triggers.
技术和数字化可以使先进、定制和更有效的产品和承保方法(如基于使用的保险、可穿戴设备、智能家居设备)，扩大分销渠道(网上销售)和改善索赔结算(如自我索赔视频和照片)。一些保险公司已开始使用先进的数据分析技术，以深入了解所涵盖的风险，从而有助于提交和索赔程序，并允许保险公司提供个性化报价。通过培养投保人和保险人之间的信任，区块链可以用来增加透明度和加快支付索赔。还可以通过开发创新的基于指数的覆盖范围和不同类型的参数触发器来扩大覆盖范围。

Microinsurance makes coverage more affordable.
小额保险使覆盖范围更加实惠。

Microinsurance
小额保险

Microinsurance can make affordable and efficient insurance products available to low-income households through unconventional product design, and distribution and claims management processes. The use of microinsurance has increased in recent years, particularly for life, property and agricultural exposures. The Microinsurance Network's World Map of Microinsurance shows that over 280 million people worldwide are covered by at least one microinsurance policy.96 Leveraging digital and mobile technologies can lower the cost of insurance and leapfrog access in markets where a traditional distribution system does not yet exist. Many successful insurance partnerships with mobile network operators are already in place, such as Bima's multitude of partnerships with mobile operators and microfinance entities across Africa and Asia.97 Insurers can also collaborate with companies in other sectors that already have close contact with potential customers, such as pharmacies or agricultural supply companies, as is the case in several countries in sub-saharan Africa.
小额保险可以通过非传统的产品设计、分销和索赔管理程序，向低收入家庭提供负担得起和有效的保险产品。近年来，小额保险的使用有所增加，特别是在生命、财产和农业风险方面。小额保险网的世界小额保险地图显示，全世界有 2.8 亿多人至少享有一项小额保险政策。与移动网络运营商的许多成功的保险合作伙伴关系已经到位，比如 Bima 与非洲和亚洲的移动运营商和小额信贷实体的众多合作伙伴关系。

Regulatory flexibility can be important to stimulate market development for microinsurance.
监管的灵活性对于刺激微型保险市场的发展可能很重要。

Regulatory flexibility can be important to stimulate market development and extend the reach of microinsurance. This can include less stringent licensing and prudential requirements, allowing electronic enrolment and administration of policies, removing taxes, and permitting distribution through non-traditional channels. The Access to Insurance Initiative reports that in 2018, eighteen countries across Africa, Asia and Latin America had adopted a microinsurance regulatory framework, and that 23 countries were in the process of doing so, up from just six in 2009.[98]

监管的灵活性对于刺激市场发展和扩大小额保险的覆盖范围可能很重要。这可以包括不那么严格的许可证和谨慎的要求，允许以电子方式登记和管理政策，取消税收，并允许通过非传统渠道分发。获取保险行动报告说，2018 年，非洲、亚洲和拉丁美洲的十八个国家采用了小额保险监管框架，23 个国家正在这样做，而 2009 年只有 6 个

96 As cited in *Background on: microinsurance and emerging markets*, Insurance Information Institute, 15 October 2018; see also http://worldmapofmicroinsurance.org/#.

引自《保险信息研究所》，2018 年 10 月 15 日;另见《http://worldmapofmicroinsurance.org/#。

97 See the "About Us" and "Where We Operate" portions of their website, http://www.bimamobile.com/ about-bima/about-us-new/.

查看他们网站的"关于我们"和"我们在哪里运营"部分，http://www.bimamobile.com/关于-bima/About-Us-new/。

98 State of microinsurance regulation 2018, Access to Insurance Initiative, 2018, https://a2ii.org/en/ our-work/results-and-learning.

，获得保险计划，2018 年，我们的工作/结果和学习的 https://a2ii.org/en/。

Insights from behavioural economics help explain consumer buying decisions.
行为经济学的见解有助于解释消费者的购买决策。

Behavioural economics and choice architecture
行为经济学和选择结构

Building an understanding of the behavioural barriers to insurance uptake provides insights into how to address them. For instance, the findings from behavioural economics research facilitates improvement in product design such as better policy wording, different coverage defaults and product bundling, that can lead to more insurance purchases. The design of default options insurance can also be important. For example, in countries where standard homeowners' policies cover all hazards, flood insurance penetration is higher.[99]

了解保险领域的行为障碍，有助于深入了解如何解决这些障碍。例如，行为经济学研究的发现促进了产品设计的改进，如更好的政策措辞，不同的保险范围违约和绑售，这可以导致更多的保险购买。默认选项保险的设计也很重要。例如，在标准房主保险覆盖所有风险的国家，洪水保险渗透率更高

Broadening default cover options or adopting an opt-out approach can increase insurance uptake.
扩大默认覆盖选项或采用选择退出方法可以增加保险吸收。

An alternative design option would be to adopt an opt-out approach, such that a property owner or renter would be insured unless they explicitly decline the cover. Meanwhile, product bundling can reduce distribution and underwriting costs as well as the decision-making efforts for a household if the catastrophe cover is added to a larger purchase. To reach farmers in rural or remote regions in emerging markets, insurers are exploring bundling agricultural insurance products, either as an add-on to existing products and services or through already-existing distribution networks.

另一种设计选择是采用选择退出办法，这样，财产所有人或租赁人将得到保险，除非他们明确拒绝保险。与此同时，如果灾难保险被添加到更大的购买中，绑售可以减少分销和承保成本，以及家庭的决策努力。为了触及新兴市场中农村或偏远地区的农民，保险公司正在探索将农业保险产品捆绑在一起，或者作为现有产品和服务的附加产品，或者通过现有的分销网络进行捆绑。

Life insurers are using behavioural economics and accelerated underwriting to reach more customers.
人寿保险公司正在利用行为经济学和加速承保来接触更多的客户。

Life insurers are already deploying innovative solutions to increase coverage and reduce the mortality gap. Three major opportunities for insurers include the use of behavioural economics to better understand the drivers of customer behaviour, accelerated underwriting to facilitate access and reduce the frictional costs of purchasing life insurance, and improved customer experience to enhance the perceived value of life insurance. New technologies and data analytics are being leveraged to this end, to use as much available data as possible and avoid costly and time-consuming medical testing as part of life insurance underwriting procedures.

人寿保险公司已经在部署创新的解决方案，以增加覆盖面和减少死亡率差距。保险公司的三个主要机会包括:利用行为经济学更好地了解客户行为的驱动因素;加速承保以方便获取和减少购买人寿保险的摩擦成本;改善客户体验以提高人寿保险的感知价值。为此目的，正在利用新技术和数据分析，尽可能多地利用现有数据，避免作为人寿保险承保程序一部分的昂贵和耗时的医疗检测。

Alternative distribution channels are instrumental in providing efficient customer service.
替代分销渠道有助于提供高效的客户服务。

New technologies and changing customer preferences are shifting the distribution landscape.
新技术和不断变化的客户偏好正在改变分销格局。

Developing new distribution channels
开发新的分销渠道

Insurers are introducing market-specific products with greater use of alternative channels such as utility and remittance companies, cellphone networks, cooperatives, financial institutions and insurance aggregators. These distribution channels can target potential customers that have not had insurance before.

保险公司正在推出针对具体市场的产品，更多地利用其他渠道，如公用事业公司和汇款公司、手机网络、合作社、金融机构和

Digital distribution can make insurance accessible to those in remote areas.
数字发行可以使偏远地区的人们获得保险。

保险集合商。这些分销渠道可以针对那些以前没有购买保险的潜在客户。

New technologies and changing customer preferences are shifting the distribution landscape. As traditional channels become saturated and the emergence of digital technologies becomes the norm, those who embrace change will have a competitive advantage. According to participants in the Insurance Governance Leadership Network, the need for insurance to be sold via more direct channels and at a lower cost is greater today than ever, since the relative share of expenses related to distribution has actually been rising since the early 2000s.[100]

新技术和不断变化的客户偏好正在改变分销格局。随着传统渠道变得饱和，数字技术的出现成为常态，那些拥抱变化的人将拥有竞争优势。据保险治理领导网络的参与者说，现在比以往任何时候都更需要通过更直接的渠道以更低的成本销售保险，因为与销售有关的费用的相对份额自2000年代初以来实际上一直在上升

The robust upsurge of mobile technology penetration in emerging markets is also increasing access to insurance products. Digital distribution will make insurance accessible to those who live in remote areas and will improve the purchasing process for both the consumer and the insurer. For example, in Chile customers in remote areas are able to purchase the mandatory motor cover online.

新兴市场移动技术渗透率的强劲上升，也增加了人们获得保险产品的机会。数字分发将使居住在偏远地区的人能够获得保险，并将改善消费者和保险公司的购买过程。例如，在智利，偏远地区的客户可以在网上购买强制性的汽车保险。

99 *Prioritizing financial protection in the face of extreme weather,* McKinsey & Company, 25 June 2019.
面对极端天气，优先考虑金融保护，麦肯锡公司，2019年6月25日。

100 *The future of distribution: insurers grapple with a rapidly changing landscape*, Ernst & Young, 2017.
分销的未来:保险公司努力应对快速变化的环境，安永会计师事务所，2017年。

The role of governments and public institutions
政府和公共机构的作用

Governments and regulators have the political and legal power to set rules to support a stable insurance market.
政府和监管机构拥有制定规则以支持稳定的保险市场的政治和法律权力。

Governments and regulators set rules that enable the insurance market to develop and expand the availability of risk transfer solutions. They share responsibility for establishing a transparent and reliable legal structure, including efficient tort liability laws, a functioning court system, effective law enforcement and adequate minimum insurance cover for compulsory lines. In addition, a sound regulatory framework regarding capital requirements, reserving standards and risk management is vital to support a stable insurance market and protect consumers. Ideally, the regulatory system will also foster innovation through, for example, supporting the use of new technologies in insurance products and distribution.

政府和监管机构制定规则，使保险市场能够发展和扩大风险转移解决方案的可用性。它们共同负责建立一个透明和可靠的法律结构，包括有效的侵权责任法、有效的法院制度、有效的执法和适当的强制性线路最低保险。此外，健全的资本要求、准备金标准和风险管理的监管框架，对于支持稳定的保险市场和保护消费者至关重要。理想的情况是，监管体系还将通过例如支持在保险产品和销售中使用新技术来促进创新。

Mandating coverage in some lines of business can help improve financial resilience.
在某些业务领域授权覆盖可以帮助提高金融弹性。

Governments can expand risk transfer by introducing compulsory insurance schemes. Compulsory insurance is used in virtually all countries, mostly as part of social security schemes related to health, old age and unemployment, or as compulsory liability insurance (eg, motor liability insurance). The main advantage of mandatory schemes is that they form the widest possible risk pools and eliminate adverse selection. Mandatory insurance schemes for property cat perils have a significant impact on RI scores but are rare (eg, France, Spain, Switzerland and Turkey). Nevertheless, mandatory insurance beyond health and motor third-party liability may be useful in improving financial resilience for households and enterprises.

政府可以通过引入强制保险计划来扩大风险转移。几乎所有国家都采用强制保险，主要是作为与健康、老年和失业有关的社会保障计划的一部分，或作为强制性责任保险(如汽车责任保险)。强制性计划的主要优势在于，它们形成了尽可能广泛的风险池，并取消了逆向选择。财产猫危险的强制保险计划对国际扶轮成绩有重大影响，但是很少见(如，法国，西班牙，瑞士和土耳其)。然而，除了健康和汽车第三方责任之外的强制性保险可能有助于提高家庭和企业的财务复原力。

Governments can offer tax benefits to promote insurance...
政府可以提供税收优惠来促进保险.....。

…and actively promote insurance as a risk transfer mechanism.
积极推动保险作为一种风险转移机制。

Governments can promote purchase with insurance vouchers[101] or offer tax benefits for low-income households. Many countries have beneficial tax rules for life and health insurance. There are also government programmes to support agro insurance. On the other hand, property and motor insurance is frequently exposed to premium taxation, reducing the economic benefits to policyholders.

政府可以用保险代金券促进购买，或者为低收入家庭提供税收优惠。许多国家都对人寿和医疗保险制定了有益的税收规则。政府还有支持农业保险的计划。另一方面，财产保险和汽车保险经常受到保费税的影响，降低了投保人的经济利益。

Encouraging financial literacy is also helpful.
鼓励金融知识也是有帮助的。

Governments can actively promote the recognition of insurance as a risk transfer mechanism. For example in China, the government is proactively encouraging provinces to use part of their budget to buy insurance. In a programme launched in 2016, Swiss Re supports a natural disaster insurance scheme in Heilongjiang province which covers 28 counties against flood, excessive rain, drought and low temperatures. It is the first of its kind in China and uses satellite and weather data

to allow for quick payouts. The scheme is a good example of how a public-private partnership can address government-assisted poverty alleviation.

政府可以积极推动承认保险是一种风险转移机制。例如在中国，政府积极鼓励各省用部分预算购买保险。在2016年启动的一个项目中，瑞士再保险公司支持黑龙江省的一项自然灾害保险计划，该计划覆盖28个县，以应对洪水、暴雨、干旱和低温。这是中国首次使用卫星和天气数据进行快速支付。这个计划是公营部门与私营机构合作如何解决政府扶贫问题的一个很好的例子。

Finally, governments and other stakeholders need to encourage financial literacy through education and outreach programmes.

最后，各国政府和其他利益攸关方需要通过教育和推广方案鼓励金融知识普及。

101Kousky, Carolyn, and Howard Kunreuther. “Addressing affordability in the national flood insurance program.” *Journal of Extreme Events,* 2014.

库斯基、卡罗琳和霍华德·昆鲁瑟。“解决国家洪水保险计划中的负担能力问题。”极端事件杂志，2014年。

Conclusion
总结

Our new indices measure the role of insurance in mitigating mounting risks to society.
我们的新指数衡量保险在缓解社会日益增加的风险方面的作用。

This *sigma* shows that the world economy has become less resilient, but that the insurance industry is keeping pace with changes in the risk landscape. Against this background, we have developed two new sets of indices. The SRI-LSE Macroeconomic Resilience Index shows that the shock absorption capacity of the global economy is weaker now than in 2007. To strengthen macro resilience, monetary policy space needs to be improved and fiscal space safeguarded by tackling current excessive debt levels. Countries should also take societal and environmental sustainability into account, and work to increase insurance penetration. Importantly, high resilience scores do not necessarily mean that a country can withstand any type of shock, come what may. Resilience starts domestically but is a shared, global responsibility.
这个标准差表明世界经济已经变得不那么有弹性了，但是保险业正在跟上风险环境的变化。在这种背景下，我们开发了两套新的指数。Sri-lse 宏观经济弹性指数显示，目前全球经济的缓冲能力弱于 2007 年。为了加强宏观复原力，需要改善货币政策空间，并通过解决当前的过度债务水平来保障财政空间。各国还应考虑到社会和环境的可持续性，并努力提高保险普及率。重要的是，高恢复力得分并不一定意味着一个国家能够承受任何形式的冲击，无论发生什么。韧性始于国内，但也是一项共同的全球责任。

Global record protection gaps of USD 1.2 trillion outline the great potential for risk transfer.
1.2 万亿美元的全球记录保护差距概括了风险转移的巨大潜力。

Since the turn of the century, the aggregate protection gap for catastrophic health, mortality and natural catastrophe risks more than doubled to a record high of
自世纪之交以来，灾难性健康、死亡率和自然灾害风险的总体保护缺口增加了一倍以上，达到年的历史最高水平
USD 1.2 trillion in 2018, equivalent to a quarter of all premiums written by the global insurance industry. This demonstrates that the industry is operating far below potential, a state of affairs which can burden governments, households and businesses with large financial losses in the event of a catastrophe or shock.
2018 年为 1.2 万亿美元，相当于全球保险业所有保险费的四分之一。这表明，该行业的运作远远低于潜力，这种状况在发生灾难或冲击时会给政府、家庭和企业带来巨大的财政损失。

Insurance resilience has improved in most regions.
大多数地区的保险弹性都有所改善。

Insurance promotes macro resilience.
保险促进宏观弹性。

The composite SRI Insurance Resilience Indices and most sub-indices have improved for both the advanced and emerging markets since the turn of the century. However, average RIs are much lower for emerging economies, and there has been a marginal decline in the global all-peril insurance index. This is because the fast-growing emerging regions, with lower levels of insurance penetration, have garnered a higher weight in the world economy, which has dragged on the global index. A key driver for global resilience lies in the potential for emerging economies to catch up in the development of their public welfare systems and private insurance markets.
自本世纪初以来，发达市场和新兴市场的综合性社会责任保险韧性指数(SRIInsuranceResilienceindex)和大多数分类指数都有所改善。然而，新兴经济体的平均风险指数要低得多，而且全球包含所有风险的保险指数也略有下降。这是因为，保险普及率较低的快速增长的新兴地区，在拖累全球经济指数的全球经济中获得了更大的影响力。全球复原力的一个关键驱动因素在于，新兴经济体在发展其公共福利体系和私营保险市场方面具有赶超的潜力。

Operating at full potential to close protection gaps, insurers could pay out an additional USD 1 trillion to policyholders each year.
保险公司充分发挥了弥补保险缺口的潜力，每年可以向投保人支付额外的 1 万亿美元。

In this *sigma*, we demonstrate a positive relationship between insurance penetration and the resilience of economies as measured by the steadiness of economic growth. We also show that higher levels of property catastrophe insurance coverage

accelerate economic recovery after a disaster event. Even so, numerous supply and demand barriers prevent insurance from fully contributing to growth and economic resilience. Tackling these barriers requires cooperation from a number of stakeholders: governments, regulators, insurers and businesses alike.

在这个标准差中，我们证明了保险渗透率和经济弹性之间的正相关关系，这种正相关是由经济增长的稳定性来衡量的。我们还发现，较高的财产巨灾保险覆盖率可以加速灾后经济的复苏。即便如此，众多的供求障碍阻碍了保险业对经济增长和经济弹性的充分贡献。解决这些障碍需要许多利益相关者的合作:政府、监管机构、保险公司和企业。

Our research offers food for thought for insurance executives, public policy makers and other stakeholders to explore new ways of harnessing insurance-based risk transfer for reducing growing vulnerabilities at the household and macroeconomic levels. With this edition of *sigma*, we hope to kick off what could turn out to be a “1 trillion dollar debate”: the amount of additional potential yearly claims payments made by insurers operating at their full potential. Closing protection gaps also makes commercial sense, translating into an estimated additional profit pool of USD 60–80 billion annually for the global insurance industry.

我们的研究为保险行政人员、公共政策制定者和其他利益攸关方提供了思考的食粮，以探索利用基于保险的风险转移的新方法，减少家庭和宏观经济层面日益增长的脆弱性。通过这一版本的 sigma，我们希望开启一场“1 万亿美元的辩论”:保险公司在充分发挥潜力的情况下，每年可能支付的额外索赔额。缩小保护差距也具有商业意义，据估计，全球保险业每年可获得 600-800 亿美元的额外利润。

Appendix
附录

SRI–LSE Macroeconomic Resilience Index
宏观经济复原力指数

Scores and rankings
分数和排名

Rank	Country	Fiscal space	Monetary policy space	Low-carbon economy	Insurance penetration	Financial market development	Human capital	Economic complexity	Labour market efficiency	Banking industry backdrop	2018 Resilience Index	2007 Resilience Index	Average ranking, 2007–2011	Average ranking, 2014–2018
1	Switzerland	0.99	0.1	1	0.72	1	0.86	1	1	0.91	0.84	0.89	1	1
2	Canada	0.99	0.18	0.29	0.61	0.85	0.93	0.55	0.94	1	0.81	0.83	2	2
3	US	0.95	0.21	0.21	0.57	1	0.74	0.93	1	0.77	0.79	0.85	9	4
4	Finland	0.99	0.12	0.73	0.89	0.57	1	0.91	0.69	1	0.77	0.80	7	4
5	Norway	0.98	0.15	1	0.26	0.73	0.71	0.57	0.79	0.87	0.75	0.83	3	4
6	UK	0.95	0.15	0.86	0.97	0.72	0.76	0.81	0.92	0.67	0.74	0.82	14	8
7	Netherlands	1	0.12	0.5	0.82	0.59	0.89	0.68	0.86	0.7	0.73	0.82	7	9
8	Denmark	0.99	0.11	1	0.95	0.16	0.8	0.6	0.98	0.79	0.72	0.81	11	11
9	Japan	0.88	0.11	0.56	0.77	0.83	1	1	0.7	0.77	0.72	0.69	18	11
10	Sweden	0.99	0.11	1	0.53	0.54	0.71	0.96	0.7	0.73	0.71	0.83	4	7
11	Germany	1	0.12	0.62	0.44	0.58	0.87	1	0.82	0.56	0.70	0.80	12	10
12	Australia	0.87	0.19	0.15	0.39	0.9	0.84	0.01	0.59	0.98	0.70	0.68	20	14
13	New Zealand	0.87	0.2	0.92	0.34	0.08	0.79	0.23	1	0.89	0.67	0.68	16	9
14	South Korea	0.95	0.19	0.27	1	0.99	1	0.95	0.33	0.42	0.66	0.66	20	17
15	Austria	0.99	0.12	1	0.26	0.28	0.79	0.86	0.54	0.68	0.66	0.78	8	16
16	Chile	1	0.39	0.73	0.28	0	0.28	0	0.37	0.97	0.65	0.72	9	13
17	France	0.95	0.12	0.93	0.77	0.45	0.71	0.73	0.3	0.73	0.64	0.75	12	16
18	Ireland	0.99	0.12	0.97	0.54	0.43	0.91	0.74	0.93	0.1	0.62	0.70	24	20
19	Belgium	0.96	0.12	0.54	0.45	0.13	0.8	0.47	0.42	0.58	0.57	0.72	17	21
20	China	1	0.3	0.04	0.23	0.58	0.24	0.35	0.21	0.29	0.55	0.51	19	18
21	South Africa	0.78	0.56	0	1	0.18	0	0.11	0.28	0.54	0.53	0.66	14	16
22	Spain	0.76	0.12	0.77	0.35	1	0.69	0.39	0.21	0.37	0.53	0.70	22	25
23	Hungary	0.86	0.29	0.56	0.02	0	0.69	0.73	0.14	0.52	0.51	0.67	22	27
24	Mexico	0.85	0.34	0.66	0	0	0.05	0.57	0	0.67	0.51	0.48	25	22
25	India	1	0.29	0.37	0.17	0.03	0	0.16	0.16	0.34	0.50	0.58	18	25
26	Turkey	0.96	0.25	0.62	0	0.24	0.34	0.06	0	0.34	0.48	0.18	29	23
27	Russia	0.97	0.29	0	0	0	0.76	0.44	0.21	0	0.44	0.54	22	24
28	Portugal	0.74	0.12	0.89	0.49	0.39	0.71	0.11	0.43	0	0.41	0.58	26	29
29	Brazil	0.32	0.24	1	0.2	0.24	0	0.3	0	0.75	0.34	0.25	27	27
30	Italy	0.33	0.12	0.78	0.71	0.78	0.69	0.58	0.15	0	0.30	0.44	28	29
31	Greece	0	0.12	0.49	0	0.21	0.42	0.03	0	0	0.06	0.29	30	31

Note: The table below shows the unweighted scores of all components. The ultimate resilience score and rank is determined by weighting the scores according to Table 1 in the main text. On the right, we show average rankings for different periods.

注意:下表显示了所有组成部分的未加权分数。最终恢复力的得分和排名是通过对得分的加权来确定的正文内的表 1。在右边，我们显示了不同时期的平均排名。

Data curation
数据管理

Adjustment for outliers and missing values were computed. We imputed missing values using either lagged values or averages for highly time-invariant indicators such as the low-carbon economy, economic complexity and the human capital index. We excluded observations above the 90th and below the 10th percentile. We forced these observations to be equal to the 90th and 10th percentile, respectively, for the majority of the indicators to avoid distorting the 0–1 scores through the "min-max" standardisation approach.

计算异常值和缺失值的校正值。我们使用滞后值或者高度时不变指标的平均值来估算缺失值，如低碳经济指数、经济复杂性和人力资本指数。我们排除了 90%以上和 10%以下的观测值。我们强制这些观察值分别等于第 90 和第 10 百分位，以避免通过"最小最大"标准化方法扭曲 0-1 分数。

Fiscal space methodology
财政空间方法

Fiscal space measures the room a country has to implement policy without facing a sovereign distress situation.[102] We estimate the fiscal space in two steps. (1) Using annual data from 1995 to 2018, we estimate distress probabilities through a panel-probit estimation following previous works.[103] Our approach uses traditional economic variables such as public debt and current account imbalances, but also takes into account the under/overvaluation of currencies[104] as this is a key adjustment valve for the real economy. Furthermore, we separate and adapt the methodology to advanced[105] and emerging economies.[106] (2) We construct the fiscal space by taking the inverse of the fiscal distress probabilities. Following our analysis of previous fiscal distress episodes, we consider that countries with probabilities of around 30% or higher have de facto no fiscal space. At these levels, distress likelihoods become highly non-linear and exposed to shifts in economic growth momentum and sentiment, as evidenced during the euro area sovereign debt crisis, for example. For the fiscal space indicator, this means that countries with a fiscal distress likelihood of 30% or higher get a zero score, while countries with likelihoods of 0% get a score of 1.

财政空间衡量的是一个国家在不面临主权危机的情况下实施政策的空间。我们的方法使用传统的经济变量，如公共债务和经常账户失衡，但也考虑到低估/高估货币 104，因为这是实体经济的一个关键调节阀。此外，我们分离和调整的方法，以先进的 105 和新兴经济体。106(2)我们构建的财政空间，采取逆财政困境的概率。根据我们对以往财政危机事件的分析，我们认为，概率在 30%或更高的国家实际上没有财政空间。在这种水平上，危机可能变得非常非线性，并受到经济增长势头和情绪变化的影响，例如在欧元区主权债务危机期间就证明了这一点。就财政空间指标而言，这意味着财政困难可能性为 30%或更高的国家得分为零，而财政困难可能性为 0%的国家得分为 1。

Monetary policy space methodology
货币政策空间方法

The monetary policy space indicator is a completely novel approach which measures the ability to ease or tighten monetary policy, depending on whether the central bank policy rate is below (ease) or above (tighten) the estimated neutral policy rate.[107] This symmetry is important for resilience, because a very high policy rate does not mean more resilience: it could also mean destabilisation as is often witnessed in emerging markets. Given the vast differences in economic and political environment of

advanced and emerging economies, we take different approaches for the two segments (see table on next page).

货币政策空间指标是一种全新的方法，它衡量放松或收紧货币政策的能力，取决于央行的政策利率是低于(放松)还是高于(收紧)估计的中性政策利率。这种对称性对于弹性很重要，因为非常高的政策利率并不意味着更强的弹性:它还可能意味着不稳定，这在新兴市场中经常见到。鉴于发达经济体和新兴经济体在经济和政治环境方面的巨大差异，我们对这两个部分采取了不同的方法(见下页表)。

102Fiscal distress is defined as a period of extreme government funding difficulty, including credit events associated with sovereign debt, recourse to large-scale multilateral financial support, implicit domestic default (eg, via high inflation rates) and/or loss of market confidence in the sovereign.

财政困境被定义为政府资金极度困难的时期，包括与主权债务相关的信贷事件、求助于大规模多边金融支持、隐含的国内违约(如通过高通胀率)和/或市场对主权失去信心。

103Gerling et al. *Fiscal Crisis*, 2017 and *Fiscal Space Across the Euro Area,*.Goldman Sachs, 2019.

格林等人。2017 年财政危机与欧元区财政空间。高盛，2019。

104Our approach uses public debt to GDP, the current account and primary balance, GDP growth, the average sovereign debt rating, a measure of government effectiveness and the metric of foreign exchange (FX) pressure. We exclude CDS prices in our analysis since we use a fundamental macroeconomic approach.

我们的方法使用公共债务与 GDP 之比、经常账户和基本收支、GDP 增长、平均主权债务评级、衡量政府效率的指标以及外汇压力指标。我们在分析中不包括 CDS 价格，因为我们使用的是基本面的宏观经济方法。

105For advanced economies we add a cubic spline element to account for the non-linear relationship between debt levels and distress probabilities. Some papers find that low debt levels are beneficial for GDP growth and that they become detrimental at higher levels (Grennes et al.*Finding the tipping point-when sovereign debt turns bad*, 2010; Baum et al. *Debt and growth: new evidence for the euro area,* 2013; Reinhart and Rogoff, *Growth in a Time of Debt,* 2010.

对于发达经济体，我们增加了一个三次样条因素，以说明债务水平和遇险概率之间的非线性关系。一些论文发现，低负债水平有利于 GDP 增长，而在高负债水平时则有害无益(grenesetal.。找到转折点——2010 年主权债务变成坏账时;鲍姆等人。债务与增长:欧元区的新证据，2013;莱因哈特和罗格夫，债务时代的增长，2010。

106For emerging markets, the debt variable is considered only linearly because our estimation shows a linear relationship between debt levels and fiscal distress. Furthermore, we include FX reserves in months of imports since it is a key metric used by the IMF and the World Bank to assess reserve adequacy in emerging economies.

对于新兴市场，债务变量被认为只是线性的，因为我们的估计显示，债务水平与财政困境之间存在线性关系。此外，我们将外汇储备包括在数月的进口额中，因为这是 IMF 和世界银行用来评估新兴经济体外汇储备充足程度的一个关键指标。

107The domestic neutral policy rate is the central bank interest rate at which it is neither expansionary, nor contractionary for the economy and inflation. We estimate this rate as the long-term real GDP trend growth rate plus the domestic central bank inflation target.

国内中性政策利率是指中央银行的利率，它既不具有扩张性，也不会对经济和通货膨胀产生收缩效应。我们估计这一增长率为长期实际 GDP 趋势增长率加上国内央行的通胀目标。

Broadly speaking, the ability to ease in advanced economies is the distance of short and long-term interest rates to the zero lower bound, as well as the US policy stance given its global relevance. This de facto captures the ability and effectiveness of rate cuts and quantitative easing.[108] The closer interest rates are to zero, the lower the resilience score. For emerging markets, the ability to ease is determined by the distance to the zero lower bound, and also by the interest rate differential versus the US and, most importantly, central bank independence.[109] We believe these are key determinants for emerging markets' central banks to conduct monetary policy effectively. The ability to tighten in advanced economies would be to measure how far away the short and long-term interest rates are from the neutral rate and fair value, respectively, though no country falls into this category currently. For emerging markets, it is again most dependent on central bank independence, the policy differential versus the Fed, and the discrepancy of the central bank rate vs neutral.

一般而言，发达经济体放松政策的能力，在于短期和长期利率距离零下限的距离，以及美国的政策立场，因为它具有全球相关性。这实际上反映了降息和量化宽松的能力和效果。108 利率越接近于零，弹性得分越低。对新兴市场而言，宽松的能力取决于与零利率下限的距离，以及与美国的利差，最重要的是取决于央行的独立性。我们认为，这些是新兴市场央行有效实施货币政策的关键决定因素。发达经济体收紧货币政策的能力，将是衡量短期和长期利率与中性利率和公允价值之间的差距，尽管目前没有任何国家属于这一类别。对于新兴市场而言，它再次最依赖于央行的独立性、相对于美联储的政策差异，以及央行利率与中性利率之间的差异。

Since the sub-components of the monetary policy space indicator are already standardised to a 0–1 value range, we do not standardise the ultimate index again to a 0–1 range. Hence, the final score is only 1 if all sub-components are at 1. Since this has never been the case, the highest value in the panel is 0.72. In any case, robustness checks show that applying this approach would only very slightly change the overall macro resilience score of a country, for example by well below 0.01 ppt in 2018 for most countries.

由于货币政策空间指标的子组成部分已经标准化为 0-1 的价值范围，我们没有再次标准化最终指标为 0-1 的范围。因此，如果所有子分量都是 1，那么最终得分只有 1。因为从来没有出现过这种情况，所以面板中的最高值是 0.72。无论如何，稳健性检查表明，采用这种方法只会稍微改变一个国家的整体宏观弹性得分，例如，2018 年大多数国家的宏观弹性得分远低于 0.01ppt。

Methodology for advanced economies

发达经济体的方法

The **ability to ease** consists of **three sub-components**:

缓解能力包括三个子组成部分:

- The **CB policy rate buffer**: This is the domestic policy rate at a given point in time – 0% as lower bound (50% weight).

Cb 政策利率缓冲区:这是在给定时间点的国内政策利率——0%作为下限(50%权重)。

- The **10-year yield buffer**: This is the domestic 10-year yield at a given point in time – 0% as the lower bound (10% weight).

10 年收益率缓冲:这是国内 10 年收益率在一定时间点-0%作为下限(10%权重)。

- **US policy space**: This is a 50%/50% average of the US central bank rate buffer and the US 10-year yield buffer (40% weight).

美国政策空间:这是一个 50%/50%的平均美国中央银行利率缓冲和美国 10 年期收益率缓冲(40%的权重)。

新兴市场研究方法

The **ability to ease** consists of **three sub-components**:

缓解能力包括三个子组成部分:

- The **CB policy rate buffer**: This is the domestic policy rate at a given point in time – 0% as lower bound (20% weight).

Cb 政策利率缓冲区:这是在给定时间点的国内政策利率——0%作为下限(20%权重)。

- **Policy rate differential versus Fed**: This is the z-score of the current policy differential of the domestic central bank vs its historical policy differential versus the Fed (30% weight).

政策利率差异与美联储:这是国内央行当前政策差异与其历史政策差异(30%权重)的 z 得分。

- **Government effectiveness**: This is a proxy for central bank independence. (50% weight).

政府有效性:这是中央银行独立性的一个代表。(50%重量)。

The **ability to tighten** consists of two sub-components:

收紧能力由两个子部分组成:

- **Central bank rate versus neutral**: This is the domestic central bank rate versus a neutral estimate (potential growth rate plus inflation target); (60% weight).

中央银行利率对中性:这是国内中央银行利率对中性估计(潜在增长率加上通货膨胀目标);(60%权重)。

- **Domestic 10-year yield versus fair value**: This is the domestic 10-year yield versus a measure of its fair value (potential growth rate plus inflation plus historical domestic term premium); (40% weight).

国内 10 年期收益率相对于公允价值:这是国内 10 年期收益率相对于其公允价值(潜在增长率加上通胀率加上历史国内期限溢价)的衡量标准;(40%权重)。

The **ability to tighten** consists of three sub-components:

收紧能力由三个子部分组成:

- **Central bank rate versus neutral**: This is the domestic central bank rate versus a neutral estimate (potential growth rate plus inflation target); (20% weight).

中央银行利率对中性:这是国内中央银行利率对中性估计(潜在增长率加上通货膨胀目标);(20%权重)。

- **Policy rate differential versus Fed**: This is the z-score of the current policy differential of the domestic CB vs its historical policy differential versus the Fed (30% weight).

政策利率差异对美联储:这是当前国内可转债政策差异对其历史政策差异对美联储(30%权重)的 z 得分。

- **Government effectiveness**: This is a proxy for central bank independence. (50% weight).

政府有效性:这是中央银行独立性的一个代表。(50%重量)。

108 Quantitative easing aims to decrease the term premium and lower long-term funding costs. When long-term rates are close to zero, the effectiveness of quantitative easing decreases as funding costs are already very low.

量化宽松旨在降低长期溢价和长期融资成本。当长期利率接近于零时，定量宽松的有效性就会降低，因为融资成本已经非常低。

109 Central bank independence is proxied by the World Bank's worldwide governance measure of government effectiveness, which considers among other elements, how free public institutions are from political interference.

中央银行的独立性受到世界银行关于政府有效性的全球治理措施的支持，该措施考虑的因素包括公共机构如何免受政治干预。

Appendix
附录

Index weights and empirical relevance
指标权重与经验相关性

The weights and relevance of the index[110] are tested for robustness through various econometric analyses.[111] The methodology consists of two parts. (1) We identify shocks on GDP growth experienced by a majority of countries at the same time and independent of shock origin (eg, external shocks, credit burst, etc).

通过各种计量经济学分析，对指数 110 的权重和相关性进行了稳健性测试。(1)我们认为大多数国家同时经历的国内生产总值增长冲击与冲击来源无关(例如外部冲击、信贷破裂等)。

(2) We undertake empirical testing of whether higher resilience levels are statistically significant in explaining higher shock absorption capacity. Given the data restrictions, the only major common shock across the 31-country sample was the global financial crisis. This tilts the weights of the index that ensure statistical significance disproportionately towards financial indicators, such as the soundness of banks.[112] We correct for this bias by adjusting the weights because our intent is to measure an economy's resilience against a broader variety of shocks that are not necessarily financial in nature. Adjusting weights slightly does not change the overall country ranking dynamics substantially, but it can lead to marginally better or worse rankings for individual countries.

我们进行实证测试，以确定较高的弹性水平在解释较高的减震能力方面是否具有统计学意义。鉴于数据的限制，在 31 个国家的样本中，唯一主要的共同冲击是全球金融危机。112 我们调整这些权数以纠正这种偏差，因为我们的目的是衡量一个经济体系抵御更广泛冲击的能力，而这些冲击并不一定是金融性质的。稍微调整权重并不会显著改变国家排名的整体动态，但可能导致个别国家的排名略有改善或恶化。

110The weights of the index were proposed and vetted by more than a dozen economists at the Swiss Re Institute and the London School of Economics and Political Sciences. The weights are supported by academic literature

该指数的权重是由瑞士再保险研究所和伦敦政治经济学院的十几位经济学家提出并审核的。这些权重得到了学术文献的支持

111We follow Sondermann, *Towards more resilient economies: the role of well-functioning economic structures*, 2016, and Blanchard and Wolfers, *The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence*, 2000, to identify common shocks across a panel of countries and to test whether higher scores in the SRI–LSE Macroeconomic Resilience Index are associated with higher shock absorption capacities

我们遵循 Sondermann 的《迈向更具弹性的经济:运转良好的经济结构的作用》(2016 年)，以及 Blanchard 和 Wolfers 的《冲击和机构在欧洲失业率上升中的作用:总体证据》(2000 年)，以确定一组国家的共同冲击，并测试 SRI-LSE 宏观经济复原力指数中较高的分数是否与较高的冲击吸收能力有关

112We increase by 12 ppt the soundness of banks, by 2 ppt labour market efficiency and the financial markets development. We decrease by 10 ppt fiscal space, by 5 ppt monetary policy score, and the human capital score by 1ppt.

我们把银行的稳健性提高了 12%，劳动力市场的效率提高了 2%，金融市场的发展也提高了 2%。我们减少了 10ppt 的财政空间，减少了 5ppt 的货币政策得分，减少了 1ppt 的人力资本得分。

SRI Insurance Resilience Indices: data and empirical framework

Sri 保险复原力指数:数据和经验框架

Natural catastrophe resilience model

自然灾害恢复模型

Swiss Re's natural catastrophe risk model MultiSNAP generates expected loss distributions for the three major perils: earthquakes, windstorms and floods. These probabilities, along with estimated market portfolios of economic and insured values, are used to estimate the current annual expected economic and insured loss caused by each peril in a particular country. Based on these simulations, expected losses in 34 selected countries were calculated.

瑞士再保险公司的自然灾害风险模型 MultiSNAP 针对三大危险:地震、风暴和洪水产生预期损失分布。这些概率，连同经济和保险价值的估计市场组合，被用来估计某一特定国家的每一种危险所造成的当前年度预期经济和保险损失。根据这些模拟，计算了 34 个选定国家的预期损失。

Data inputs are GDP by country (or GDP by province for countries where provincial data is available), insurance take-up rate by country and peril, and risk exposure and property concentration by locality. Insurance take-up rate by country and peril are our best approximations given knowledge of each country's insurance markets and regulatory frameworks. Property concentration and risk exposure by locality are based on data collected on insured asset portfolios and natural science-based risk factors, which are proprietary data to Swiss Re.

数据输入是按国家分列的国内生产总值(或有省级数据的国家按省分列的国内生产总值)，按国家和危险分列的保险承保率，以及按地区分列的风险和财产集中程度。考虑到对各国保险市场和监管框架的了解，按国家和危险划分的保险承保率是我们最接近的估计值。按地区划分的房地产集中度和风险敞口是根据保险资产组合和基于自然科学的风险因素收集的数据，这些数据是瑞士再保险公司的专有数据。

These proprietary model results are complemented with expected loss estimates for another 120 countries from the United Nations Office for Disaster Risk Reduction's (UNISDR) *Global Assessment Report*. Insurance coverage rates for these countries are based on average historic catastrophe loss data or modelled in relation to GDP per capita for a few countries without sufficient historic data.

联合国减少灾害风险办公室(减灾办公室)的《全球评估报告》中另外 120 个国家的预计损失估计数补充了这些专有模型的结果。这些国家的保险覆盖率以历史灾害损失平均数据为基础，或参照少数几个国家的人均国内生产总值建立模型，但没有足够的历史数据。

Regional index values are derived by back-casting the current model-based estimates based on changes in the share of average historic insured vs economic losses for a region as per our catastrophe loss database.

根据我们的灾害损失数据库，区域指数值是通过回溯当前基于模型的估计得出的，这种估计是基于一个区域的平均历史保险与经济损失之比的变化。

Mortality resilience index model

死亡弹性指数模型

To measure the evolution of resilience over time, we measure the development of insurance protection in relative terms (ie, we define mortality resilience indices as the financial protection available divided by the financial protection needed):
为了衡量弹性随时间的演变，我们以相对的方式衡量保险保障的发展(即我们将死亡弹性指数定义为可用的财政保障除以所需的财政保障):

- Protection available: the financial resources available include: (1) financial assets (we assume 50% are relevant while the rest is saved for retirement); (2) survivor benefit payments from social security (and other government-sponsored programs); and (3) proceeds from existing life insurance coverage.
可利用的保障:可利用的财政资源包括:(1)金融资产(我们假设 50%是相关的，其余的储蓄用于退休);(2)来自社会保障(和其他政府资助项目)的遗属恤金;(3)来自现有人寿保险的收益。
- Protection needed: the financial resources needed by surviving dependents is calculated as the sum of: (1) household's income replacement need (we assume 10 times annual household income as adequate); and (2) debt repayment
需要保护:未亡家属所需的财政资源按以下方式计算:(1)家庭的收入替代需要(我们假设家庭年收入的 10 倍为充足);(2)债务偿还(eg, mortgages).
(如抵押贷款)。

We measure the mortality I-RI for the working population with dependents (ie, households which have a need for financial protection).
我们测量有受抚养人(即需要经济保障的家庭)的工作人口的 I-RI 死亡率。

Appendix
附录

Health insurance resilience index model
医疗保险复原力指数模型

To track how the resilience with respect to health care spending has evolved over time, we apply the same concept as for the mortality I-RI (ie, we divide covered healthcare spending by total healthcare spending):
为了追踪卫生保健支出的弹性是如何随着时间演变的，我们采用了与死亡率 I-RI 相同的概念(即我们将覆盖的卫生保健支出除以总的卫生保健支出):

- Protection available: the protection available is the sum of actual health care spending paid by (1) public / compulsory schemes; (2) private health insurance; and (3) “non-stressful” (ie, desired OOP spending on health).
可提供的保护:可提供的保护是由以下方面支付的实际卫生保健开支的总和:(1)公共/强制计划;(2)私人医疗保险;(3)“无压力”(即期望的 OOP 在卫生方面的开支)。
- Protection needed: the total healthcare expenditure regardless of financing mode.
需要保护:不论融资方式的总医疗支出。

We therefore need to estimate “non-stressful” OOP expenditures. For this purpose, we first perform a cross-country panel analysis regressing the “total” share of household consumption spend OOP on health on country characteristics (explanatory variables) such as income level, healthcare financing system,[113] total healthcare expenditure and the population share (as reported by the WHO) facing catastrophic OOP spending on health. The model allows us to estimate what the country-specific “total” share of household consumption spend OOP on healthcare is under an international benchmark.
因此，我们需要估计“无压力的”OOP 支出。为此，我们首先进行一个跨国家的面板分析，回归家庭消费的“总”份额对健康的 OOP 支出的国家特征(解释性变量)，如收入水平，医疗融资系统，113 总医疗支出和人口比例(如世卫组织报告的)面临灾难性 OOP 支出的卫生。该模型使我们能够估计，在国际基准之下，特定国家的家庭消费中 OOP 在医疗保健方面的“总”份额。

However, to calculate the protection available, we are interested in the “non-stressful” part only (ie, excluding the “stressful” part). In the regression model, two explanatory variables drive the stressful part. The first is the healthcare financing system. We assume that with a national health service, OOP expenses mainly exist to steer consumer behaviour. Thus we create a benchmark for non-stressful OOP spending by using the regression model results to predict the counterfactual “what if” outcome of all countries having a national health system. The second is the population share with catastrophic OOP spending, where a higher WHO estimate for that variable is associated with high OOP expenses. Thus in total, to derive “non-stressful” OOP spending, we deduct from the “total” the country-specific OOP spending attributable to the absence of a national health service under the benchmark regression results above, and adjust for a high population share facing catastrophic OOP spending in WHO data, defined as a spending more than 10% of household income OOP on health.
然而，为了计算可用的保护，我们只对“无压力”部分感兴趣(即，不包括“压力”部分)。在回归模型中，两个解释变量驱动应激部分。首先是医疗融资体系。我们假设，在国民医疗服务中，OOP 支出主要用于引导消费者的行为。因此，我们通过使用回归模型结果来预测所有拥有国家卫生系统的国家的反事实“如果”结果，从而为无压力的 OOP 支出创建一个基准。第二个是灾难性 OOP 支出的人口比例，世卫组织对这一变量的估计较高与 OOP 支出较高有

关。因此，总的来说，为了得出”无压力”的 OOP 支出，我们从”总额”中扣除了因上述基准回归结果没有国家卫生服务而造成的国别 OOP 支出，并调整了在世卫组织数据中面临灾难性 OOP 支出的高人口比例，即在卫生方面支出超过家庭收入 OOP 的 10%。

113Defined by four groups using 25%, 50% and 75% of total healthcare expenditure paid through government or compulsory schemes as thresholds.

以政府或强制性计划支付的医疗保健总支出的 25%、50%和 75%作为阈值，由四组人员确定。

Micro-macro connection models

微观-宏观连接模型

For this section of the analysis, we constructed two different data sets for two types of models.

在这一部分的分析中，我们为两种类型的模型构造了两个不同的数据集。

For the first set of models, we constructed a panel data set with data for 55 countries with significant natural catastrophe events (economic losses > 1% of GDP) for the period 1990 to 2017. In these models, GDP growth was the dependent variable, modelled as an autoregressive (AR) process. Other explanatory variables were added in different specifications to explore the impact of the shock and recovery from natural catastrophes on GDP growth. Similar AR models were analysed for government expenditure and credit-to-private-sector responses to catastrophe events.

对于第一组模型，我们用 1990 年至 2017 年期间发生重大自然灾害事件的 55 个国家(经济损失占国内生产总值的 1%)的数据建立了一个面板数据集。在这些模型中，GDP 增长是一个因变量，以自回归(AR)过程为模型。以不同的规格增加了其他解释性变量，以探讨自然灾害的冲击和复苏对国内生产总值增长的影响。对政府支出和信贷给私营部门对灾难事件的反应的类似 AR 模型进行了分析。

For the second set of models, we constructed a panel data set with annual data for 165 countries for the period 1990 to 2017. For these models, volatility of GDP growth was the dependent variable, also modelled as an AR process, with other growth and volatility-related explanatory variables added to control for the volatility process, including dummies for bank or financial crises. In a number of specifications, the impact of non-life insurance penetration, quality of institutions and a number of other explanatory variables on GDP volatility was explored.

对于第二组模型，我们用 1990 年至 2017 年期间 165 个国家的年度数据建立了一个面板数据集。对于这些模型，国内生产总值增长的波动性是一个因变量，也被模拟为一个增长和波动性相关的解释性变量，以控制波动性过程，包括银行或金融危机的模型。在若干规格中，探讨了非寿险普及率、机构质量和若干其他解释性变量对国内生产总值波动性的影响。

For both models, data on insurance penetration (non-life direct premiums as % of GDP) come from Swiss Re. Real GDP growth, GDP per capita, inflation, gross domestic savings (% of GDP) and other macro series are taken from Oxford Economics. Government expenditure data come from the IMF and domestic credit to private sector (% of GDP) from the World Bank. A set of bank crisis dummies comes from a dataset by Laeven and Valencia,[114] in other specifications, dummies for the Asian Financial Crisis, GFC and others, were determined by the authors. The institutional quality dataset is from Aljaz Kuncic.[115] Data on natural catastrophes comes from the Swiss Re Institute proprietary natural catastrophe database. We extracted a sub-set of data with information on the economic and insured losses of natural catastrophes of so-called primary perils (earthquakes, storms and floods).

对于这两个模型，保险渗透率(非人寿直接保费占 GDP 的%)的数据来自瑞士再保险。实际 GDP 增长，人均 GDP，通货膨胀，国内总储蓄(GDP 的%)和其他宏观数据摘自牛津经济学。政府支出数据来自国际货币基金组织，国内信贷来自世界银行的私营部门(占 GDP 的%)。一组银行危机假人来自拉文和巴伦西亚的数据集，其他 114 个规格，亚洲金融危机假人，全球金融中心和其他，由作者确定。机构质量数据集来自 AljazKuncic。115 自然灾害数据来自瑞士再保

险协会专有的自然灾害数据库。我们提取了一组关于所谓主要危险(地震、风暴和洪水)的自然灾害的经济损失和保险损失的信息。

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答:Kuncic，，可在https://sites.google.com/site//aljazkuncic/research获得。

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