

Calculating the cost of climate change

By Carles Vergara

The coronavirus was only the latest disaster to hit real-estate markets. Now is the time to think more, not less, about the effects of climate change on your business.





As companies reconfigure their business strategies in light of the global health crisis, one of the smartest things they can do is factor in climate change, if they haven't already. Climate change was impacting businesses around the world even before the onset of COVID-19, on top of ongoing disruptions related to technology, demographic shifts and globalization. The coronavirus pandemic has amplified all these risks, bringing them into sharp relief.

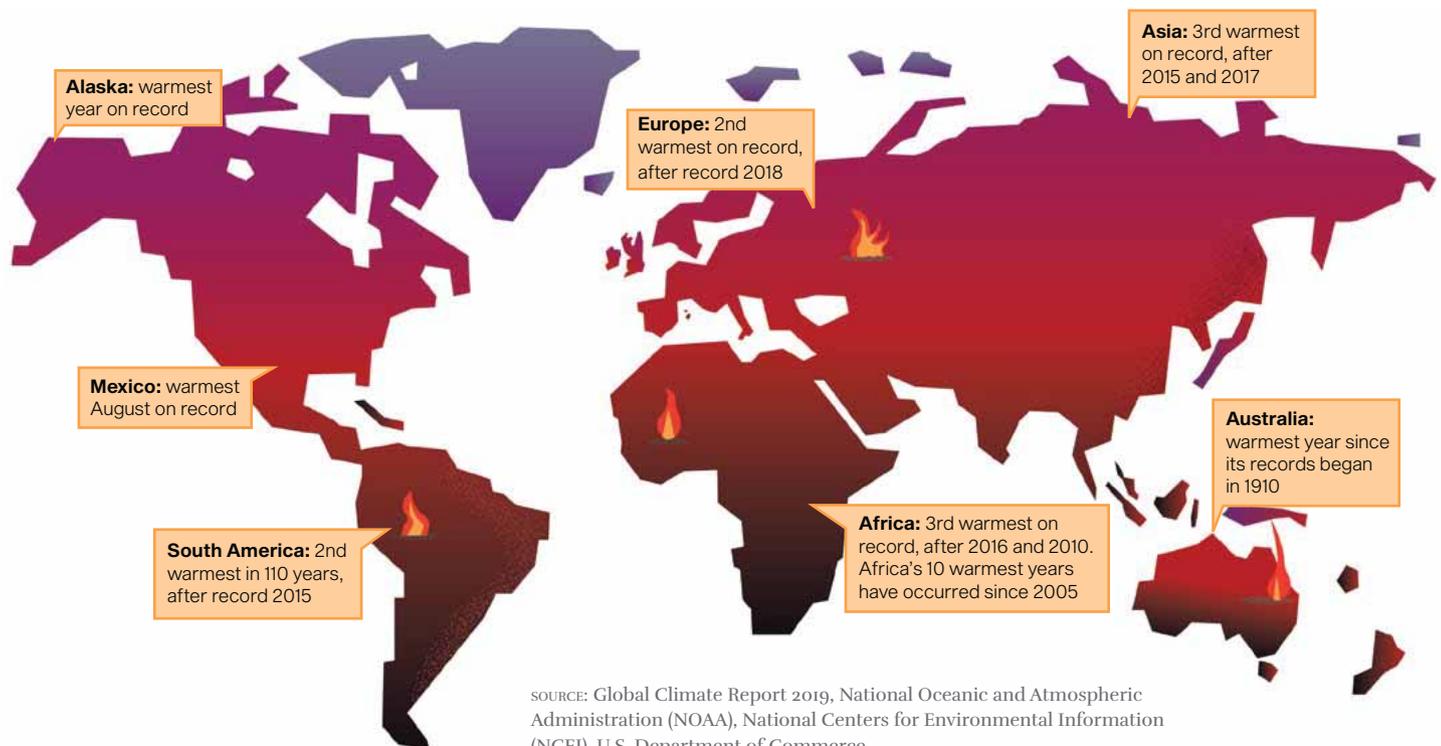
Now, as we find ourselves adapting to what some are calling "the big reset," it's worth considering how to better prepare your business for extreme events. My research on real-estate markets tested by climate change illustrates how companies across different sectors may need to recalculate the costs and their exposure to assets susceptible to abrupt value losses owing to climate-related catastrophes.

The rise of catastrophic events

The rise of extreme events will make some locations that were once desirable places to live, visit, work or trade become less so. Whether pandemics such as COVID-19 or climate-related disasters, recent events have exposed systemic weaknesses that, unless addressed, will continue to afflict certain locations more than others, with direct or indirect impacts on business activity. Real-estate industry professionals, in particular, should be keeping a closer eye on them.

My research with colleagues from the Haas School of Business of the University of California, Berkeley, highlights the consequences of destructive events on real-estate markets, with wide-ranging implications for mortgage lenders and insurance companies, but also for construction companies, developers, urban planners, infrastructure providers, regulators and property owners. Specifically, we studied wildfires in California over two

Significant climate anomalies in 2019



The rise of extreme events will make once-desirable locations to live, work or trade become less so

decades, merging data on fires, mortgages, property characteristics and weather.

Our findings were surprising – though there should be nothing surprising about climate-related events like fires and flooding, which are happening with such frequency that no business should treat them as “black swans.” In California, wildfires have become so commonplace that people no longer talk of a wildfire “season” anymore. They happen all year long and are expected to increase in frequency and severity, owing to warmer and drier conditions.

At the same time, other factors are contributing to wildfires in the state: more homes being built in forested areas; a buildup of brush growth that ends up fueling larger fires; and aging power lines. The latter were directly linked to the so-called Camp Fire in 2018, which destroyed around 19,000 homes and other structures and killed 85 people (with one person still missing). It was the deadliest wildfire in California’s history, the most expensive in the world in terms of insured losses, and it bankrupted Pacific Gas & Electric (PG&E), the utility company responsible for the faulty lines.

Wildfires in other regions of the United States, from Appalachia to Alaska, have also become more prevalent. And many other countries are experiencing similar trends. In Australia, the bushfire “season” that began in June 2019 continued well into 2020. Although January 2020 may seem

like a lifetime ago, the Australian bushfires were the top story in the world until they got eclipsed by COVID-19.

Apart from the destruction of millions of acres of land and thousands of homes and buildings, these events cause important drops in air quality, with smoke in the case of Australia reaching Chile and Argentina. (We don’t have to think too far back, either, to remember the havoc wreaked when the eruption of an Icelandic volcano spewed an ash cloud that closed European airspace, cancelled over 100,000 flights, and disrupted businesses, supply chains and travel during the spring of 2010.)

Flooding events are also multiplying. An OECD study on Cities and Climate Change listed Miami, Guangzhou, New York, Kolkata and Shanghai as the top five cities in terms of assets exposed to coastal flooding, in that order. A two-meter rise in sea levels would mean the disappearance of Miami Beach; with three meters, the land where San Francisco’s airports are located today will be underwater. Tokyo, Hong Kong, Amsterdam and Rotterdam are also predicted to be significantly affected.

Meanwhile, in 2019, England and Wales experienced the wettest February since 1766, when recordkeeping began, causing severe winter flooding and infrastructural damage at a time when more real estate urgently needs to be built to deal with serious housing shortages across Britain.

Tackling the issue

What should business leaders, particularly those in at-risk geographical areas, do to grapple with these extreme (yet largely foreseeable) challenges?

ANALYZE YOUR EXPOSURE. First, recognize that, no matter how remote the issue may seem today, it *will* impact your industry in some way soon. Have you analyzed your exposure to climate-related

risk? Do your competitive advantage and investment decisions include the impact of climate change and, now, pandemics? How are competitors likely to respond to these same risks?

ADJUST YOUR STRATEGIES AND BUSINESS MODELS.

Second, think deeply about how climate change and other extreme events should be factored into your business strategies. Start gathering data that can be incorporated into your business models and can guide your decision-making. By introducing climate change and other risks into your business models, it will be possible to identify new opportunities and avenues for growth.

Changes in location, for example, can create new business opportunities. Locations with once livable temperatures will become hotter, making them more difficult to endure for some people. As a result, the way cities are designed and the materials used in buildings will change. Green buildings will remain attractive, since they offer cost savings on utility bills due to greater energy and water efficiency, and deliver higher property values for developers. How communities address these issues will be vital to their attractiveness.

MAKE REASONABLE IMPROVEMENTS. With regard to the adage of a disaster being an opportunity for change, we found that to be the case in our research.

As you would expect after a fire, we found an uptick in mortgage delinquency and foreclosure rates. However, what surprised us from our data set of houses and mortgages and California wildfires between 2000 and 2018 was that the larger the fire, the lower the level of default and foreclosure. And instead of moving away from the affected area, as is generally the case after a disaster, homeowners continued paying their mortgages and rebuilt homes that ended up having an even greater estimated market value. Based on data taken from one neighborhood,

The bigger the devastation, the more that homeowners are required to rebuild according to stricter codes

homes that were once valued at an average of around \$200,000 were rebuilt and are now worth \$1 million or more.

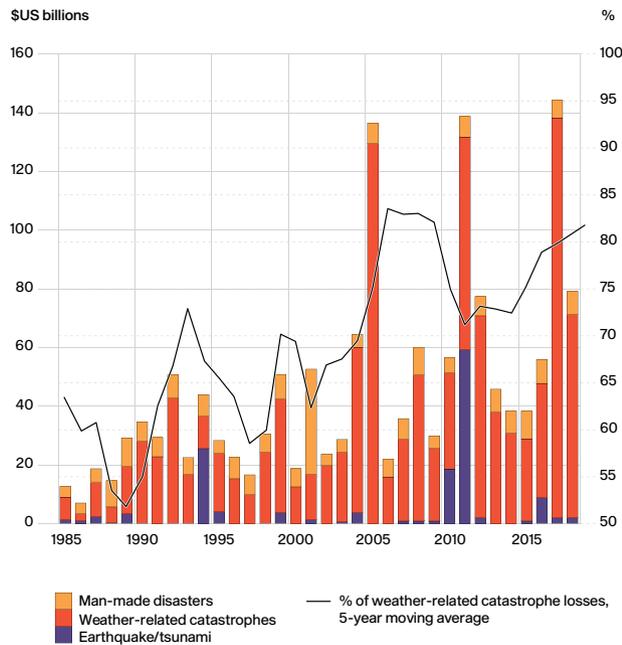
How can this be so? Our research suggests this happens because of externalities associated with large destructive events. The bigger the devastation, the more that homeowners are required to rebuild according to stricter codes and the stricter requirements demanded by insurance companies in order for them to continue granting coverage. These factors work together, leading to the reconstruction of homes that are more modernized in terms of infrastructure, which in turn makes them more valuable.

Schneider Electric's Chief Innovation Officer Emmanuel Lagarrigue noted a similar trend at work in an IESE video talk on the consequences of the coronavirus lockdowns: "We're seeing a lot of innovations in the residential market. If people are staying at home and realizing that their vacations this year will be at home, they're investing more in their homes. In places like California and Australia, where there are electrical grid failures, people are investing in solar storage systems to make

Weather-related insured losses and the number of natural loss events are increasing

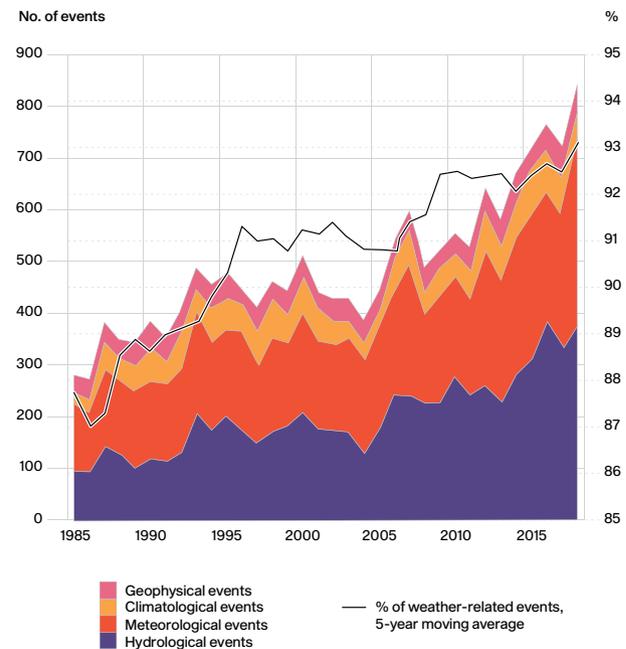
Global insured catastrophe losses

The share of weather-related catastrophe losses has increased steadily to account for over 80% of insured catastrophe losses in 2018.



Number of relevant natural loss events worldwide

The upward trend is accompanied by a growing frequency of weather-related loss events, the number of which hit a record in 2018.



SOURCE: European Central Bank

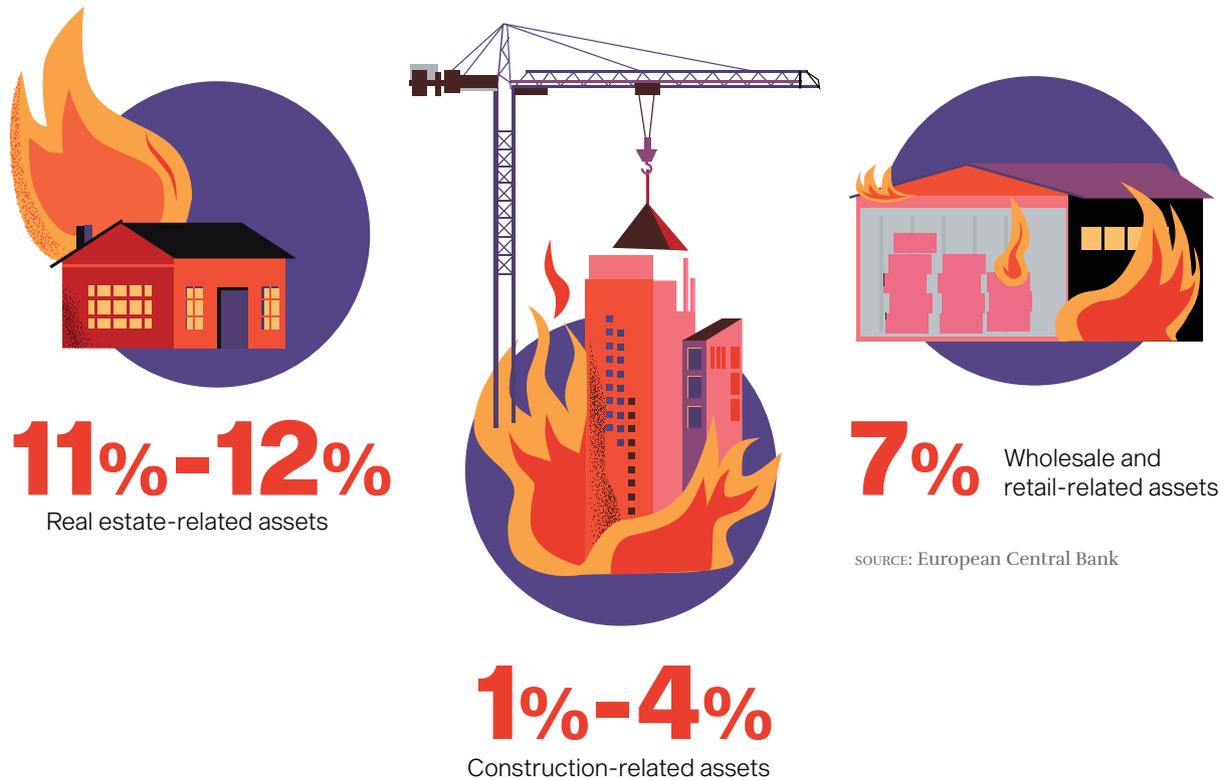
their homes more economical and sustainable. Trends like these have been one of the big surprises of the crisis.”

Bear in mind this dynamic only works so long as there is a well-functioning financial services market to continue to cover costs. The size of recent losses, compounded by the additional costs being racked up from the coronavirus pandemic, casts doubt on the continued ability of financial service providers to absorb more losses. Reinvesting in the same spot may not be the most sustainable solution. There are a lot of ifs – chief among them, whether climate-risk trendlines are improving or deteriorating in a given area.

PLAN FOR THE LONG-TERM RAMIFICATIONS. As the previous points indicate, homeowners and businesses may benefit from making immediate upgrades to account for climate risk, and those who prepare sooner rather than later are also more likely to benefit. That being said, there’s no escaping the fact that, over time, insurance will only get more expensive. In California, state regulators have prohibited insurance companies from dropping policyholders, imposing a one-year moratorium in areas struck by fires. Even so, any such measures are temporary. Insurance rates are still skyrocketing, making insurance less and less affordable for those who need it most.

Sectoral exposure statistics can provide a first approximation of risk

Euro area banks' exposures as a share of total exposures



In some cases, insurers may no longer be willing to insure properties. Without insurance, it will be impossible to obtain a mortgage. This means people will have to pay in cash, which will limit demand. This will have an important effect on mortgage markets and housing prices.

You already see this trend among lenders. JPMorgan Chase, one of the largest mortgage lenders in the U.S., was among the first to raise borrowing standards in April 2020 as the coronavirus lockdown began to bite there, and many other banks soon followed suit, tightening their lending requirements, raising minimum credit scores and demanding bigger down payments, from an average of 6-10% to 20% or more. As one report noted: “At a time when it’s challenging enough to buy or

sell a home due to social distancing guidelines, these changes in mortgage policies will make it even more difficult for many first-time applicants to access funding. It’s an especially cruel position to be in when historically low interest rates means credit is cheaper than ever.” Longer term, this would contribute to a widening of the wealth gap – something that was already at unsustainable levels before the latest crisis hit.

Between climate change and COVID-19, those offering financial services face unprecedented challenges and greater levels of systemic risk. Those working in the industry should be building new benchmarks and doing regular risk modeling similar to the stress-tests developed and carried out by central banks following the 2008 global financial crisis.



The author



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Earlier this year, the European Central Bank (ECB) announced that it would be assessing banks, insurance and reinsurance companies, credit agencies and other financial institutions in terms of how well they were approaching climate-related risks and pricing it into the market. The ECB defined three categories of risk:

- **Disregard:** Does your company disregard the risk of climate change, leading you to price risk inappropriately or not keep enough in reserve?
- **Delay:** Have you not gotten around to analyzing your exposure? You may find yourself scrambling to catch up as new regulations and disclosure requirements demand that you report on your exposure or get left behind.
- **Deficiency:** Do your risk assessments ensure sufficient quantity and quality of resources to mitigate the impact and pay for the costs of future disasters?

It's worth reflecting on these in terms of your own business. No one can consider themselves immune.

In his 2020 letter to investors, BlackRock Chairman and CEO Larry Fink was in no doubt: "What will happen to the 30-year mortgage – a key building block of finance – if lenders can't estimate the impact of climate risk over such a long timeline, and if there is no viable market for flood or fire insurance in impacted areas? From Europe to Australia, South America to China, Florida to Oregon, investors are seeking to understand both the physical risks associated with climate change as well as the ways that climate policy will impact prices, costs and demand across the entire economy. These questions are driving a profound reassessment of risk and asset values."

Although COVID-19 has understandably dominated the 2020 agenda, businesses must not take their eyes off the ball and ignore the ongoing, no-less-existential threats posed by climate change. If, as some believe, the coronavirus pandemic reinforces the case for more responsiveness and engagement, and a shoring up of our systems and institutions to deal more effectively with exogenous shocks, then we should expect – and demand – more thorough risk assessments of climate-related events. ■

READ MORE: "Mortgage Markets with Climate-Change Risk: Evidence from Wildfires in California" by Paulo Issler, Richard Stanton, Carles Vergara and Nancy Wallace. Working Paper (2020).