STATEMENT OF ROBERT B. LITTERMAN, PHD

CHAIR, CFTC CLIMATE-RELATED MARKET RISK SUBCOMMITTEE CONCERNING

"Climate-Related Economic Risks and Their Costs to the Federal Budget

and the Global Economy"

DELIVERED TO

UNITED STATES SENATE COMMITTEE ON THE BUDGET

FEBRUARY 15, 2023

Chairman Whitehouse, Ranking Member Grassley, and members of the Committee: Thank you for inviting me to address the economic risks associated with climate change, and the tremendous costs they may impose on Americans, American businesses, and the federal, state, and local governments.

This summer I visited Greenland with a diverse group of individuals interested in studying the melting of its icesheet. We spoke with scientists, policy experts, entrepreneurs, and local people who are predominantly Inuit. The icebergs calving from the glaciers are impressive and beautiful, but they represent the very beginning of what, sadly, will be an inevitable acceleration of sea level rise the extent of which, however, is both highly uncertain and depends critically on the actions that we take today.

Our grandchildren will likely be alive in 2100, but sadly they are underrepresented among today's electorate. In their lifetime global sea level rise is estimated to be between two feet and ten feet, depending primarily on how quickly we reduce our emissions. That sea level rise will impose huge costs on our society and government. Indeed, in 2016, Freddie Mac estimated that the economic losses from sea level rise are "likely to be greater in total than those experienced in the housing crisis and Great Recession." And that was in 2016. Projections for sea level rise have only gotten more dire since then, as scientists have learned more about the vulnerabilities of the Greenland ice sheet and several massive West Antarctic glaciers.

Before I go any further, I'd like to tell you a bit about my background, as much of my work is highly relevant to today's subject. My name is Bob Litterman. I am an economist by training and have spent my career managing financial risk. I worked at Goldman Sachs for 26 years. I was a partner and head of our firmwide risk department. I am now the chair of the risk committee at Kepos Capital, and I sit on several boards for groups that study and propose responses to climate risk, including the Climate Leadership Council, which I co-chair with Kathryn Murdoch; the Niskanen Center, which I chair, the Woodwell Climate Research Center, the University Corporate for Atmospheric Research, and the World Wildlife Fund.

In 2020, I chaired the CFTC climate-related Market Risk Subcommittee which published a unanimous and widely cited report, "Managing Climate Risk in the U.S. Financial System." It is important to note that the Subcommittee included experts from a variety of backgrounds, including agribusiness companies like Cargill and Bunge, oil and gas companies like

ConocoPhillips and BP, banks like JPMorgan Chase and Citi, and environmental organizations like The Nature Conservancy. This was no collection of wild-eyed environmental activists. This was the collective work of people with a variety of perspectives and backgrounds. Nonetheless, we came to the unambiguous conclusion that climate change poses several important risks to the American economy. As we wrote in the report:

"Climate change is expected to affect multiple sectors, geographies, and assets in the United States, sometimes simultaneously and within a relatively short timeframe. […T]ransition and physical risks—as well as climate and non-climate-related risks—could interact with each other, amplifying shocks and stresses. This raises the prospect of spillovers that could disrupt multiple parts of the financial system simultaneously. […] A sudden revision of market perceptions about climate risk could lead to a disorderly repricing of assets, which could in turn have cascading effects on portfolios and balance sheets and therefore systemic implications for financial stability."

The physical risks of climate change are those that stem from the disruptions it causes via rising seas, more severe storms and floods, more frequent droughts, more intense heatwaves, and more destructive wildfires. Property is destroyed. Supply chains are disrupted. Crops wither. Labor productivity declines.

The transition risks of climate change are those that stem from changes in policy, technology, and/or consumer preferences. As lower carbon technologies become cheaper, demand for fossil fuels will decline. As more and more consumers demand sustainable products, demand for fossil fuels will decline. And as governments around the world take steps to decarbonize their economies, demand for fossil fuels will decline.

This process can lead to stranded assets in carbon intensive sectors. If investors have not managed this risk, it may cascade through the economy. Central banks have estimated the losses in the energy sector at up to $4 trillion in the energy sector, and up to $20 trillion in the broader economy.

Some might be tempted to say, well why not simply stop trying to decarbonize if the risk of stranded assets is so large. Well first of all, the losses from the physical risks of climate change are likely to be far larger. And second, even if U.S. policymakers made no effort to reduce emissions, Europe and China and other nations will. And consumers the world over will continue to demand lower carbon products. The U.S. represents a little over four percent of the global population. We are less than a quarter of GDP. If much of the rest of the world transitions, it won't matter what U.S. policymakers do or don't do. The demand for carbon-intensive products will crater, and with it the value of carbon-intensive assets.

In our report, we extensively examined the literature around the economic costs and risks associated with climate change. We found that by the end of the century, every degree the planet warms will shave around 1.2 percentage points off of GDP. Scientists currently estimate that we are on track for somewhere between 2.2 and 3.4 degrees of warming by 2100, which would result in GDP losses of somewhere between 2.6 and 4 percent. That's more than our recent annual growth rate, implying the possibility of long-term negative growth as climate change worsens.

In the agricultural sector, we found that climate change is likely to significantly reduce crop yields, decrease labor productivity, degrade soil and water quality, increase the range and virulence of pests, and disrupt supply chains.

Climate change will also impose large costs on companies and governments by degrading infrastructure. One example the CFTC report highlighted was the case of Pacific Gas and Electric in California, which entered bankruptcy because of $30 billion in liability associated with its infrastructure sparking record wildfires. Meanwhile, the effects of climate change loom even larger in the future. Losses from billion-dollar extreme weather events totaled $165 billion last year and while it varies from year to year, it is clearly growing rapidly over time.

Extreme weather events are becoming more common as the atmosphere warms. Terms such as the 100-year flood are used to describe the magnitude of an event that has happened historically on average once every 100 years. That happens to be an important frequency. We build infrastructure to withstand events that happen on a regular basis, and so the damage created by weather that happens every so often is small, but when the magnitude is a 100-year event, it typically leads to complete destruction of property.

The problem is that today such a term continues to describe the magnitude of extreme weather events, but the frequency of their occurrence today tends to be much higher. 100-year floods may happen every 5 or 10 years today because of the changing climate.

Insurance markets are critical to diversify these risks and to create appropriate incentives for individuals, companies, and communities to prepare for extreme weather by building hardened infrastructure and buildings, or to move to locations with less exposure to climate-related risks. But insurance markets are not working properly because historical loss experience is no longer relevant for predicting future losses.

Different regions will be affected by different hazards and abilities to adapt and mitigate damages. Declining real estate values — driven by climate-related impacts or the perception of such impacts in the future — could substantially depress regional economic activity. Some populations and local communities within the United States may ultimately be required to relocate, with potentially significant economic losses for households and investors.

What's more, we found that a decline in real estate values can have larger implications for the U.S. economy and financial sector. For most U.S. households, housing constitutes the largest share of household wealth, and substantial evidence suggests that household spending varies with housing wealth. In addition, because most residential real estate is purchased with a mortgage, declines in mortgage values could affect financial market participants, including banks that hold these mortgages on their balance sheets, investors in mortgage-backed securities, and government-sponsored enterprises (GSEs), primarily Fannie Mae and Freddie Mac, which guarantee the default risk of the mortgages they securitize. Emerging evidence suggests that lenders are passing along riskier mortgages to the GSEs, in part, to remove risk from their own books. The federal guarantee of the GSEs suggests that U.S. taxpayers may ultimately be on the hook for prepayment and default risks associated with the impacts of physical risks on collateral values.

Climate change will also likely inflict large costs on human health, and by extension, significantly reduce labor productivity in certain sectors. Estimates of the annual monetized damages from premature deaths due to extreme heat in 2090 range from $60 to $140 billion. Lost labor hours could reach six percent in parts of Florida and Texas.

There are also a number of risks related to crossing a tipping point. A tipping point is a nonlinearity in the response of a system. There are a number of worrying potential tipping points in the climactic system. For example, the warming of permafrost may melt frozen landscapes allowing significant additional quantities of greenhouse gases to enter the atmosphere and accelerate the warming. More worrying still, recent scientific research suggests that we may cross several of these tipping points with even only 1.5 degrees of warming, and may cross several additional ones with 2 degrees of warming.

While the subject of this hearing is the economic risks and costs associated with climate change, I would be remiss if I did not mention one last thing. All of the research and analysis on this subject agrees that the sooner we act to reduce emissions, the fewer costs and risks we incur. In addition, it appears that transitioning to a low carbon economy will actually result in substantial economic growth.

I have lots of ideas on this subject, but the bottom line is that with global average temperatures already having risen over 1 degree C, and with potentially catastrophic tipping points on the horizon, risk management demands an immediate ambitious response, including globally harmonized incentives to reduce carbon emissions. There are steps that this Congress can take to move this process forward and I would welcome the opportunity to discuss the policies you might pursue to help de-risk the economy and ensure that prices reflect the costs associated with production of goods.

Thank you kindly for the invitation to testify today. I hope that this testimony has helped shed some light on the under-appreciated fact that climate change is not just an environmental problem, it is an economic and financial one as well. Because of the nature of climate risks, time is not on our side. There are real costs to waiting. While many of the individual risks from climate change can be managed well by companies, individuals, and governments, the systemic nature of climate risk means we should be doing much more to price it and reduce greenhouse gas emissions.

I and my colleagues at the Climate Leadership Council, the Niskanen Center, and others stand ready to help you deliberate on these policies and do what is best for Americans and the future. Thank you for your attention and I look forward to answering any inquiries you may have.

Appendix:

CFTC Report of the Climate-Related Market Risk Subcommittee,

"Managing Climate Risk in the U.S. Financial System"