

EconoFact Chats: The Economic Implications of Climate Change

Galina Hale, UC Santa Cruz

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Michael Klein:

I'm Michael Klein, Executive Editor of EconoFact, a nonpartisan web-based publication of the Fletcher School at Tufts university. At EconoFact, we bring key facts and incisive analysis to the national debate on economic and social policies, publishing work from leading economists across the country. You can learn more about us and see our work at www.econofact.org.

Michael Klein:

An overwhelming majority of climate scientists agree that we are facing drastic climate change. Scientists warn that if global temperatures increase more than two and a half or three and a half degrees eahrenheit, there will be severe damage to the Earth's ecosystem. And current projections tell us that this temperature rise is likely to occur. This will result in adverse outcomes for human health and wellbeing. There's also an increasing awareness that climate change poses economic and financial risks. What are these risks? How will they impact the economy, and financial markets? And can these risks be mitigated? The Federal Reserve Bank of San Francisco held a conference in November 2019 entitled, The Economics of Climate Change. One of the organizers of that conference is my guest today on EconoFact Chats, Galina Hale. Galina served as an economist at the Federal Reserve Bank of San Francisco, and is now a professor at the University of California at Santa Cruz. Galina, welcome to EconoFact Chats.

Galina Hale:

Thanks, Michael. Great to be here.

Michael Klein:

Galina, last August, a New York Times article stated that Lael Brainard, the current vice chair of the Federal Reserve, has emphasized that "the unpredictable nature of climate change could make obsolete the historical models on which economic policy is based." Can you analyze what this statement means for our listeners and what its implications are?

Galina Hale:

You go directly to the hard question, Michael. Let me start from a few steps away. The economy is highly interconnected with the environment in which we live. In addition to the obvious reliance on natural resources, such as minerals, water, air, it functions in a system that economic models tend to take as given. For example, current geographical distribution of people, the types of agriculture, the location of the industry. Climate change is likely to alter those factors. Temperature and precipitation patterns are already being affected.

Michael Klein:

For example, the historical drought that we saw in the West?

Galina Hale:

Exactly. This is the drought that's the worst in 1200 years, and our current economic models do not take such changes into account. The economic effects of these changes are very complicated, which means you cannot just do a simple extension of the model. Because if you do a simple extension, the predictions

are not going to be accurate. Also, because these changes are unprecedented, at least in recent human history, we cannot rely on the analysis of historical data to predict the future.

Michael Klein:

I guess we don't have economic data from 1200 years ago that we could use, do we?

Galina Hale:

Exactly.

Michael Klein:

Well, if we look more recently during the last financial crisis, which began in 2008, many people became familiar with the term, black swan, meaning events that might not have a very high chance of occurring, but if they do, they can be very destructive. What are climate related black swan events?

Galina Hale:

This is a great question. And there are definitely climate related black swan events. In fact, some people introduce the term, green swan, to describe such events.

Michael Klein:

Wait, wait, Galina, there is such a thing as a black swan. There is no such thing is a green swan, right?

Galina Hale:

Well, not yet. Who knows? Well, there are two types of potential green swan events. First is an extreme weather event types that are due to physical changes from climate risk.

Michael Klein:

And we've seen some of these already, obviously, right?

Galina Hale:

Right. Some of those effects of climate change are already with us. We have storms and hurricanes, droughts, and massive wildfires that we now observe a lot more frequently than we did historically, and they also tend to be more severe. The second type of the green swan events is due to changes that we need in order to transition to a net zero economy, or other adjustments that are needed to limit global temperature rise. These changes might make some assets obsolete. For example, carbon fuel companies, or internal combustion cars, or gas furnaces. If we're not allowed to use those anymore, and if that change happens abruptly and unexpectedly, in the financial markets, we can see rapid changes in asset prices. And if that happens all at once, there is a possibility that it can sink a number of financial institutions that hold those assets and that can create a financial crisis not unlike the one we remember from 2008 that you referred to.

Michael Klein:

I guess a key point here, Galina, is that asset prices reflect not current events, but what people expect in the future. And if people's perceptions of the future change, asset prices can change very, very swiftly.

Galina Hale:

That's correct. That's exactly the point.

Michael Klein:

So given the magnitude of the problem, should we not focus on the transition risks until we get the other risks under or control? Or should we try to avoid rapid mitigation efforts to avoid transition risks?

Galina Hale:

This is a great question, and the one I get frequently when I talk about transition risks. And the answer is no, because it's important to understand that the risks and costs associated with transition to a more sustainable global development and less temperature rise; those costs and risks increase the longer we wait. It's important to address those questions upfront, and we need to take those risks into account in... especially, the financial institutions need to realize that those risks are present. But, by no means, we should be delaying implementation of the changes that will limit the temperature rise.

Michael Klein:

Because we're already at a point where it could be a crisis and it might be hard to reverse those, right?

Galina Hale:

Exactly. And the longer we delay the larger the adjustments we're going to need to make.

Michael Klein:

Are there other kinds of climate related risks that we haven't seen yet, but likely we will see?

Galina Hale:

Yes. I think another type of the physical effects of climate change is less dramatic. It's a slow and steady process, such as an increase in average temperatures, that is also related to the sea level rise. But those risks, even though they're not happening abruptly, they're very high, because they would affect many cities. They could affect entire countries that are at the low elevation over the sea level, and even entire islands. It's already an issue for Miami, and we already see that some of the people living in the Pacific Islands, they're moving to Australia because they see that their current...where they live is becoming unsustainable. And you can easily see financial risks associated with those events. Loss of real estate values, costs to insurance companies in any of the assets that are related to these.

Michael Klein:

So, I guess, as the price of real estate in Miami falls, the price of real estate in Mile High City, in Denver, might rise.

Galina Hale:

It might, but you have to keep in mind that we still have this other risk, such as risk of wildfires, that could be affecting areas like Denver and surroundings, as we saw recently with a devastating wildfire near Boulder, Colorado.

Michael Klein:

Galina, an important role of financial markets is to assess risk and to distribute it widely, especially to those who are more willing to bear it. Effectively, this is providing insurance. This was a view that led to some complacency before the 2008 financial and economic crisis. But what we saw then was that the insurance analogy broke down, basically because you can insure against idiosyncratic events, like a car

crash, but not against catastrophic events, like an earthquake. So we see in active market in car insurance, but not so much for earthquake insurance. I guess that the financial risks associated with climate change present challenges more like those associated with earthquake insurance than with car insurance.

Galina Hale:

Yes, that's exactly right. Insurance is supposed to pool the risks and it works because for example, not everyone has a car accident at the same time. Otherwise, premiums would either not be sufficient to cover the required payout, or they will be too high for people to choose to buy insurance to begin with, as it is the case with earthquake insurance. It exists, but most people choose not to buy it. And this is exactly because earthquake insurance is covering everybody who is affected at the same time when the earthquake happens. Climate change presents this exact type of the correlated risk. And there's also a feedback between the economy and the financial sector with those risks. You can call it a doom loop, because the worse the economy is doing, the worse the financial sector is doing, which feeds back on the performance of the economy, as we saw in 2008.

Michael Klein:

What are some of the specific financial risks associated with climate change?

Galina Hale:

I think the major concern is a systemic financial risk, like we saw in 2008.

Michael Klein:

So a systemic risk. By that, you mean, that everybody is affected or a large number of institutions are affected at the same time?

Galina Hale:

That's right. Large number of institutions are affected at the same time, and the system, as a whole, does not have enough buffer to help those institutions recover. As we saw in 2008, there is a feedback loop between the weakness of financial system and the weakness of the economy. The Wall Street and the Main Street are interconnected.

Michael Klein:

Well, that happened in 2008. What's the consequence of climate change? What does that feedback look like for climate change?

Galina Hale:

Well, climate change mitigation and adaptation efforts that need to happen to allow economy to function, as it does now, require a lot of money. Both the government and the private sector have to invest in these efforts to bring us to the path that's sustainable. If there is a financial crisis, it will undermine such efforts, making the risks even higher. So would be like a green doom loop, if you will.

Michael Klein:

So there's a green swan and a green doom loop?

Galina Hale:

That's right.

Michael Klein:

Also, I imagine that these risks are not equally borne across all people or all segments of society. Different people face different kinds of risks or different degrees of risk from climate change.

Galina Hale:

That's right and that's where the discussions of climate change and the discussions of social justice come together. And there is even a field of study that's called, climate justice. And this is also one of the reasons that climate policies were delayed for decades is because the countries that experienced the largest effects of the climate change are not the countries that contribute most to the problem. It is also true across social groups within countries. Wealthier people tend to have a much larger carbon footprint, so think about wealthier people that live in bigger houses that need to be heated or cooled, producing a lot of emissions. They might be flying private jets. They might have many cars. They don't ride public transportation. And they tend to live in the areas that are less affected by climate change, such events like flood, fire, or hurricane.

Michael Klein:

So maybe the political economy of this is just as the countries that were most affected by climate change didn't have as much of a voice in the world's decisions, within a country, like the United States, the people who are most affected might not have as strong a political voice as those who are less affected.

Galina Hale:

That's correct.

Michael Klein:

So, given these risks, what can the Federal Reserve do? You were at the Federal Reserve. You helped organize the conference. What's the scope for the actions by the Federal Reserve?

Galina Hale:

Well, so in the recent news, Lael Brainard said, in October, that the Fed is including climate considerations in its bank stress tests.

Michael Klein:

The stress tests are when you look at a bank's balance sheets and you try to figure out how vulnerable they are?

Galina Hale:

That's right. The Fed, for the largest banks, does a very detailed analysis of what an economic downturn would mean for the bank's balance sheet, but not just for individual bank, the whole banking system. The Fed's trying to assess how much of the overall losses we should expect from a economic downturn. And now, it's including climate scenario into this economic downturn scenario. Other central banks around the world are also doing climate tests, some for many years. And what this means is the banks now have to report their exposure to the climate risks that we discussed in different climate scenarios that the world might be facing.

Michael Klein:

What do the results of these tests look like?

Galina Hale:

Well, so one of the things we already learned is that it's very difficult to report bank's exposure to those risks. And so, I think one of the goals of the exercise is to understand better how the banks are exposed to those green swan events, and encourage banks, by doing that, to recognize the climate risks when they're evaluating credit risks of their portfolio. The second goal, I think, is more of a mitigation type, because once the banks recognize climate risks in their portfolio, this is likely to result in moving some of the bank funding from climate change contributors, such as CO2 emitting companies, to climate change solutions, such as solar panel producers. And that would, by itself, help us avoid some of the more severe disasters.

Michael Klein:

I guess the banks also have a self-interest in avoiding, for example, giving mortgages to places that are under threat from climate of being destroyed or having their values diminished.

Galina Hale:

Exactly. Think about the most recent devastation due to the Colorado fire, as we already mentioned. If the financial institutions that extended credit to the developers who built those new housing areas that are very close to the wildfire areas, if they took into account the increasing probability of the wildfires that results from the climate change, maybe the cost of this credit would have been too high to even have this development happen, and people maybe wouldn't have built there.

Michael Klein:

So I guess this is related to the issue of flood insurance provided by the federal government. When the federal government provides flood insurance, it increases the incentive for people to build in flood plains, places that might be now very much affected by rising sea levels.

Galina Hale:

Exactly. And one reason the government has to provide this insurance is because financial... private insurance companies find that it's not profitable for them, because the risks might be too high. Similarly, in an area where I live, the risk of the wildfire is too high. And two years ago, the very last insurance company that was offering home insurance to us is no longer offering home insurance, so we have to go with the California State home insurance.

Michael Klein:

I think that points to an important political issue. A lot of these proposed changes must be very controversial.

Galina Hale:

That's right. Going back to the Fed policies, some people say that climate change should not be something that the Fed is focusing on, because it's the institution in charge of monetary policy. And they would have been right about 30 years ago when, if we did something to mitigate climate change at that time, the risks, the financial risks in particular, probably wouldn't have been as large. But by now, the climate change may be posing systemic financial risk, and we don't know unless we actually do those stress tests. And because of the systemic financial risks that are possible from these green swan events, this falls squarely within financial stability portion of the Fed's mandate.

Michael Klein:

I guess most people don't recognize, or at least until 2008 did not recognize, that the Fed was doing more than just setting monetary policy, but it was also very much concerned with financial stability. In 2008, that became more apparent, but perhaps it's a little less apparent when we think about not an acute sudden event, like the collapse of markets in the fall of 2008, but more long-term events, like climate change, where we don't see right away the effect of it.

Galina Hale:

That's right. And that's what Mark Carney, who was the Governor of the Bank of England, called the tragedy of horizons. A lot of people understand that there might be some risks and dangers far away in the future, but most decision makers don't have a long enough horizon to do anything about that. And that's actually where the Fed has an advantage, because the Fed is not a political institution. It doesn't have to go through election cycles, and it might have a longer horizon, and therefore might be able to take these concerns into account. More specifically, the Fed's mandate actually has many parts, so everybody knows about monetary policies, stable prices, and low unemployment, that's the goals they're trying to reach. And we just started with conversation asking me about macroeconomic models.

Galina Hale:

Monetary policy actions depend on the forecasts that are produced by macroeconomic models. And those models will be affected by slow and steady climate change effects. But the other portions of the Fed mandate are financial stability, as you mentioned, but also smooth functioning of the payment system, and banking development in disadvantaged communities. And so, if you go... in her speech at the San Francisco Fed conference in 2009, that you discussed in the beginning, Lael Brainard gave a speech in which she outlined how climate change affects each of the portions of the Fed mandate. And that could probably take the whole other podcast, so we probably don't have time to discuss it, but the listeners can read the speech at San Francisco Fed website or the Board of Governors website.

Michael Klein:

Galina, these are really important issues. And I'm glad that you helped bring them to the attention of the public at-large by helping to organize the conference at the San Francisco Fed in 2019. And I'm also especially thankful that you joined me today on EconoFact Chats, so our listeners have a better understanding of this.

Galina Hale:

Thank you, Michael. It was good to discuss those problems with you.

Michael Klein:

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