Motivation for conducting climate stress tests of firms

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The Value of Climate Stress Tests

Stress tests have been implemented widely following the 2007-2008 financial crisis to assess the resilience of individual firms and the system as a whole to extreme, but plausible stress scenarios. Back then, the scenarios against which firms were being stress tested were primarily financial in nature. As has become increasingly clear to policymakers today, climate change poses one of the most salient emerging risks to financial markets and society more broadly. The challenge of transitioning to a carbon-neutral economy is the challenge of this decade and century. For these reasons, central banks are starting to conduct climate stress tests of financial institutions. The Bank of England, for instance, will conduct its first climate stress test of banks in 2021.

As Mark Carney sets out in his 2015 speech "Breaking the Tragedy of the Horizon – Climate Change and Financial Stability", financial and non-financial firms face three major types of risk associated to climate change and the transition. These are: physical risk, transition risk and legal risk. Because many firms maintain a horizon no longer than the business cycle, many have not yet incorporated these three risks in their decision-making processes. Climate stress testing such firms can then help the firm identify how it would fare if it were to maintain its current business model over a longer horizon, given plausible climate, technology and transition scenarios. The climate stress test can also help the firm identify its costs and opportunities arising from the physical impact of climate change and the transition to a zero-carbon economy. Finally, the climate stress test can help inform the firm how it might strategically update its business model to emerge from climate change and the transition most valuably. Climate stress tests could thus help accelerate the transition to a carbon-neutral economy by making firms understand when transitioning their business models to green ones is in their interest. Credible and sufficiently stringent policy paths to combat climate change will thus render the case for transitioning stronger. Climate stress tests could be done on many types of firms, including energy companies (in this assignment), banks, asset managers, insurers, airlines, mortgage lenders, supermarkets and insurers.

The Use of Scenarios in Climate Stress Tests

At least four main types of physical risk and transition risk scenarios for the climate stress test of the firm can be envisioned. On one end of the spectrum is the case where the Paris accords are not met at all. Physical risk will then be extreme while transition risk will be absent. This scenario is coined the hot-house world scenario by the Network of Greening the Financial System (NGFS). On the other end of the spectrum is the case where the Paris accords are expected to be met. If the climate policies are introduced early and slowly then the transition risk is expected to be less pronounced, whereas if the policies are rolled out late and sharply, then transition risk will likely abound. The early predictable transition corresponds to the NGFS's "orderly transition scenario" and the late sharp transition to the "disorderly transition scenario". Finally, the NGFS envisions a scenario where policies to tackle climate change are introduced both "too little and too late", resulting in some transition risk and material physical risk. In the stress test of the energy company, you will investigate how the energy company's decision to transition to a green business model depends on its expectations future policies to combat change as set out by the NGFS, among other factors.

Rationalizing Firm Decision-Making using Climate Stress Tests

More and more firms are adapting their business models in the light of climate change and the transition. Major oil companies, such as Shell and British Petroleum (BP), have announced their plans to transition to a green business model. Whereas some other oil companies, such as ExonMobil continue their efforts of sticking to a brown business model (despite opposition from e.g. investors). Climate stress tests can help rationalize what factors affect the decision of energy companies to transition to a green business model or stay brown. These factors include the government policies that energy companies expect to be in place. Brown energy companies in developing countries, for instance, are often beneficiaries of substantial government subsidies, making it less attractive financially for these firms to transition than for energy companies in countries with effective climate policies. Other factors that will affect decision-making, include the firm's expectation about future technological developments and the future costs of green energy.