Expecting the Unexpected: Macroeconomic Volatility and Climate Policy

by Warwick J. McKibbin, Adele Morris, and Peter J. Wilcoxen

Overview

Because any effective international climate policy will need to be in place for centuries, many unexpected macroeconomic shocks will occur during the policy's existence. This paper explores how such shocks affect global economic conditions under three different international climate policies: a cap-and-trade system, a harmonized carbon tax, and a hybrid policy. The results show that in many respects, carbon tax and hybrid policies are more resilient than a cap-and-trade system.

Discussion

The global financial crisis, a looming global recession, and turmoil in credit markets drive home the importance of developing a global climate architecture that can withstand major economic disruptions. Such an architecture needs to be resilient to large and unexpected changes in economic growth, technology, energy prices, demographic trends, and other factors that affect the costs of emissions abatement. The stability of global policy has important environmental implications for two reasons. First, collapse of the policy could set back progress on emissions reductions for years. Second, since the decisions of economic actors depend on their expectations of future policy, policies that are vulnerable to shocks are less likely to encourage long-term investments in new technologies and emissions reductions.

This paper uses a computational macroeconomic model to explore how shocks in the global economy propagate under three different climate policy regimes: a cap-and-trade system, a globally-harmonized carbon tax, and a hybrid system of national long-term permit trading. The paper examines two kinds of shocks relevant to recent experience: (1) a positive shock to economic growth in China, India, and other developing countries, and (2) a sharp decline in housing markets and a rise in global equity risk premiums, causing severe financial distress in the global economy. The paper compares economic results under the three climate regimes in the decade following the shock and draws inferences about which regimes offer the strongest incentives to sustain participation in the climate agreement.

The results show that although these three climate regimes appear to be similar in their ability to reduce carbon emissions efficiently, they differ in how they affect the transmission of economic disturbances between economies. These differences have important implications for the political robustness of these policies.

Key Findings & Recommendations

➢ *All else equal, a climate regime that exacerbates downward macroeconomic shocks or depresses the benefits of positive macroeconomic shocks would be more costly and less stable than a system that better handles global business cycles and other volatility.* This occurs because macroeconomic shocks can cause the cost of regulation to be much higher or lower than anticipated. These economic surprises can subject governments to enormous pressures to relax or repeal taxes or other policies perceived to impede economic growth.

➢ *Any policy framework whose costs or benefits depend strongly on forecasts of the future state of the world or national economic conditions is likely to fail, because the forecast is likely to be wrong.* Countries committing to targets and timetables for emissions reductions are committing to a policy with highly uncertain costs. A global climate framework needs to endure even in the face of the wide variety of shocks that will undoubtedly occur over the coming decades. Thus, there must be a mechanism built into the framework that directly addresses the issue of cost uncertainty.

▹ *It is critical to get the global and national governance structures right.* There must be a clear regulatory regime in each country and a transparent way to smooth out excessive short-term volatility in prices. A system that enables or even encourages short-term financial speculation in climate markets may collapse at huge expense to national economies. A hybrid system provides many of the advantages of a permit system while limiting opportunities for speculation through the annual permit mechanism.

▹ *Since shocks in one part of the world will certainly occur, the global system needs to have adequate firewalls between national climate systems to prevent destructive contagion from propagating local problems into a system-wide failure.* A global cap-and-trade system would be extremely vulnerable to shocks in any single economy. A system based on national hybrid policies, on the other hand, would be explicitly designed to partition national climate markets and limit the effects of a collapse in climate policy in one part of the world on climate markets elsewhere.

▹ *In many respects, a global cap-and-trade system is less robust to macroeconomic shocks than a carbon tax or hybrid system.* A global cap-and-trade system can cause unexpectedly high growth in one country to reduce growth in other economies. Carbon taxes and hybrid policies are not vulnerable to this effect. Additionally, if a global financial crisis were to occur, a cap-and-trade system would miss the opportunity for significant additional low-cost emissions reductions.

CONCLUSION

The global financial crisis of 2008 has starkly emphasized a number of important lessons for the design of global and national climate policy. These lessons need to be considered explicitly during international negotiations for future climate agreement. Anticipating shocks may mean rejecting global climate policies that reduce emissions reliably in stable economic conditions but are vulnerable to collapse in volatile conditions.

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ABOUT THE HARVARD PROJECT ON INTERNATIONAL CLIMATE AGREEMENTS

The goal of the Harvard Project on International Climate Agreements is to help identify key design elements of a scientifically sound, economically rational, and politically pragmatic post-2012 international policy architecture for global climate change. It draws upon leading thinkers from academia, private industry, government, and non-governmental organizations from around the world to construct a small set of promising policy frameworks and then disseminate and discuss the design elements and frameworks with decision-makers. The Project is co-directed by Robert N. Stavins, Albert Pratt Professor of Business and Government, John F. Kennedy School of Government, Harvard University, and Joseph E. Aldy, Fellow, Resources for the Future.

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