CONTROLLING COSTS WHILE CONTROLLING EMISSIONS – A PRICE COLLAR APPROACH TO CAP-AND-TRADE

Background

The economic effects of the cap-and-trade provisions of H.R. 2454, the American Clean Energy and Security Act of 2009, and similar bills remain in dispute, with some arguing that a cap-and-trade program would create jobs and improve economic growth and others arguing that the program would hit households with large energy price increases. Studies report a large range of cost estimates in part because analysts make different assumptions about economic growth in the absence of the cap, the cost of lower carbon energy, the availability of offsets and the responsiveness of abatement efforts to a given carbon price.

Our recent study modeled a reduction of fossil carbon emissions in the U.S. by 83 percent relative to 2005 levels by 2050. We assumed that all the emissions were abated domestically and that the cap-and-trade program included no flexibility measures such as banking and borrowing or land use offsets.

We found:

- To hit the 2050 target, the United States. would reduce its cumulative emissions relative to business as usual by 38 percent to 49 percent, or about 110 to 140 billion metric tons of CO_2, depending on the trajectory of annual emissions.
- The cap-and-trade program would create an annual value of emission allowances peaking at around $300 billion by 2030, and a total value of about $9 trillion from 2012 to 2050.
- The program would lower U.S. gross domestic product (GDP) by about 2.5 percent relative to what it would otherwise be by 2050. Put another way, emissions control would delay the baseline projected level of GDP for 2050 by one year.

Our results are largely consistent with other modeling exercises. However, despite the modest expected cost, concerns about *unexpectedly* high costs and volatile allowance prices hinder prospects for the legislation. Higher-than-expected prices could undermine the consensus for action and lead to abrupt and disruptive collapse of the program. Lower than expected prices pose a downside risk for investors in energy efficient and low carbon technologies. The uncertainty about costs is significant in both directions.

H.R. 2454 includes measures intended to lower the cost of the program, but none of them sets a fixed upper bound on the costs. The U.S. Senate could significantly improve on the House-passed legislation by including a predictable and transparent measure to control the stringency of the program. In particular, a price collar that ensures that allowance prices fall within a predictable range could provide assurances to households, investors, and emitters alike and preserve strong but feasible incentives to abate.

H.R. 2454 includes a price floor. Adding the price ceiling would allow the Senate to jettison the reserve auction, rein in offsets, and possibly raise more federal revenue, both by selling allowances if the ceiling triggers and by setting a reserve price for auctioned allowances. With these changes, the resulting bill would be simpler, more transparent, and more reliable in limiting the downside risk to the economy.

Recommendations

Predictably limiting the range of allowance prices can prevent unexpectedly lax or costly climate policy. A price collar is a transparent and simple approach that ensures strong incentives to abate emissions while reducing the downside risk to the economy and preserving the consensus for action. Our modeling work shows that a range that begins between $10 and $35 in 2012 and rises at a real rate of interest (about 4 percent over inflation) would keep allowances prices strong but feasible.

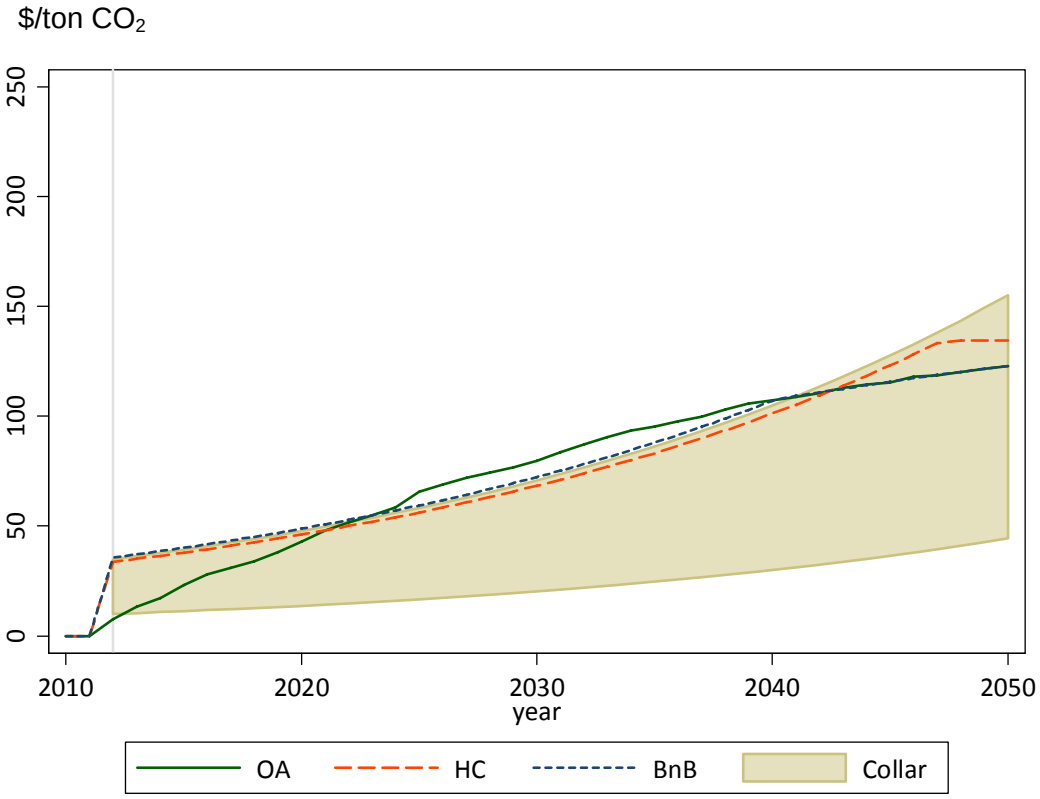
The price collar approach would be a simpler, more predictable, and more transparent way to control the costs of the program than allowance borrowing or a reserve auction. In particular, the ceiling would closely follow the allowance price path that would hit the long run emissions goal at the minimum overall cost.

The price ceiling could work like the “safety valve” included in a 2007 bill introduced by Senators Jeff Bingaman (D-NM.) and Arlen Specter (D-Penn.), which would have allowed the government to sell additional emissions allowances if permit prices rose above a pre-set ceiling.

The chart on the next page shows the price collar we propose in the shaded region.

- If banking allowances and offsets are prohibited and the emissions path hits the midterm targets proposed by the Obama Administration, the allowance price would follow the green (OA) curve. (The targets in the H.R. 2454 produce a similar, but slightly higher path.)
- With banking (but not borrowing) the allowance price would follow the blue (BnB) curve, which is just at the upper boundary of the price collar.
- The cost minimizing price path that achieves the same overall environmental performance appears in orange.
- Including offsets could reduce the price, but by how much is uncertain.

Figure 1. Allowance price paths and a $10/$35/4% price collar



The Price Ceiling Is Simple to Administer

Under a price ceiling, the government could sell an arbitrary number of additional emissions permits at the ceiling price. This price could be near or slightly higher than the expected market price so that it would have little or no effect if expectations are correct.

- The additional permits would be good only in the year sold and could not be banked. The ceiling price sets a gradually-rising ceiling on the marginal cost of abatement and the market price of emissions permits. Because the ceiling rises at the real interest rate, firms would not buy large volumes of extra allowances expecting a large return on selling them later.

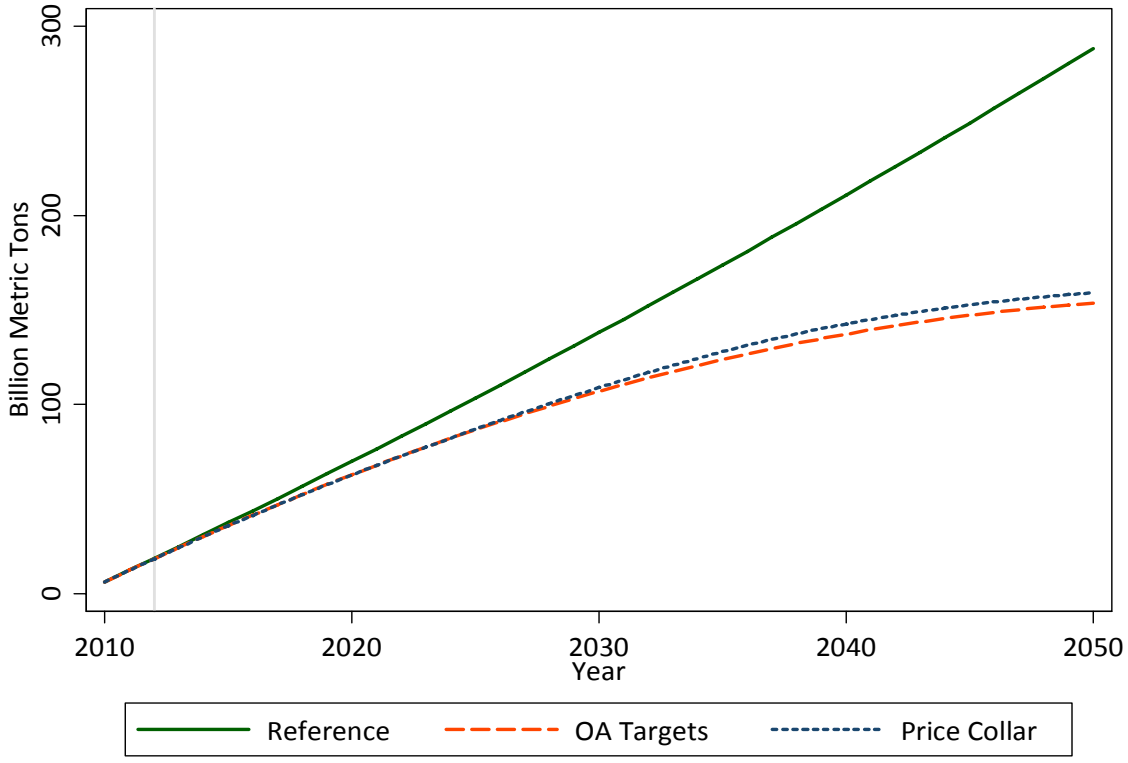
- The government could implement the ceiling simply. Firms would just buy the allowances they need, if any, at the set price from the government.

The Expected Environmental Effects of the Price Ceiling are Minimal

- Our study modeled a cap-and-trade program with a price collar and *no other cost control measures*, a scenario in which the price ceiling would likely bind. We found that relative to a cap-and-trade policy without a price ceiling, a price collar with starting limits of $10 and $35 per ton would increase cumulative emissions over the period from 2010-2050 by about 4 percent, or 6 billion metric tons. Figure 2 shows the cumulative emissions for both policy approaches; emissions without the collar (orange curve) is only slightly below emissions with the price collar (blue curve).

- If the program includes offsets, the price collar may have no effect on expected emissions. However, it would still offer protection against unexpected costs or delays in offset supply.
- The at most modest effect of the price collar on the expected environmental performance of the program provides complete protection against extremes in economic outcomes.

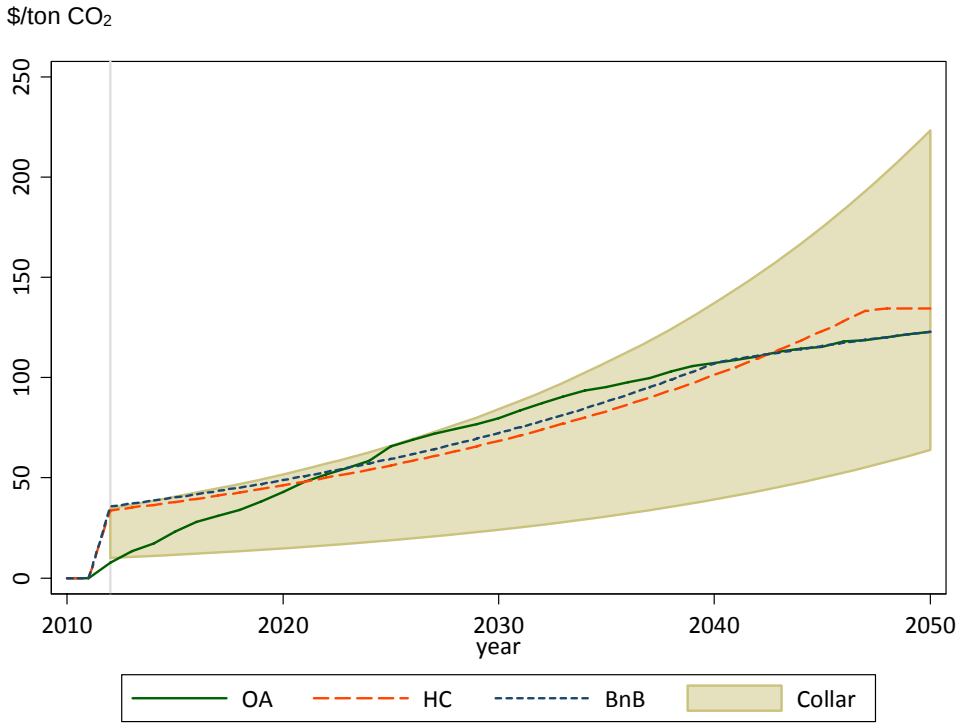
Figure 2. Cumulative U.S. Emissions of CO_2



Increase the Prices at the Real Interest Rate

Our work suggests the price floor and ceiling should rise at the real rate of interest, or about 4 percent over inflation. Figure 3 below shows a price collar that begins from $10 and $35 and rises at 5 percent. This higher rate can result in a price ceiling by 2040 that is well above the expected price and the efficient price. Prices that grow faster than real interest rate makes allowances attractive as financial investments as well as compliance tools.

Figure 3. Allowance price paths and a $10/$35/5% price collar



Advantages over the Approach in the House Bill

Just as we propose, the House bill starts the price floor at $10 per ton of carbon dioxide equivalent in 2012. The program sets a reserve price on auctioned allowances equal to the price floor, ensuring strong incentives to abate. To control costs, it includes offsets, a reserve auction and borrowing provisions, and it allows firms to bank unused allowances and then sell them later when costs are high. A clear price ceiling offers several advantages over the H.R. 2454 approach:

- While in theory offsets can provide low cost alternatives to domestic fossil energy abatement, their environmental performance and supply are uncertain. The more environmentally rigorous they are, the more costly they will be. Further, it may take some time before large cost-containing volumes of offsets are available. Thus it makes sense to supplement offsets with a transparent and predictable limit to the costs in the program.

- The reserve auction is drawn from allowances from other years, moving stringency from one year to another. This approach cannot protect against unexpectedly high costs over the long term.

- Borrowing also moves stringency from one year to the next, is complicated to administer, and does not truly limit costs.

- The price ceiling can provide revenue when costs are unexpectedly high. The government could use this to compensate households or the poor, or it could lower the federal deficit or other tax burdens.

Brookings Experts

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Required Reading

"Consequences of Alternative U.S. Cap-and-Trade Policies: Controlling Both Emissions and Costs," by Warwick J. McKibbin, Adele Morris, Peter J. Wilcoxen and Yiyong Cai, The Brookings Institution, July, 2009.

"A Copenhagen Collar: Achieving Comparable Effort Through Carbon Price Agreements," Warwick McKibbin, Adele Morris, and Peter J. Wilcoxen

"The Economic Impact of Climate Change Reduction Strategies," by Warwick J. McKibbin, Adele Morris, Peter J. Wilcoxen and Yiyong Cai, Presentation, June 8, 2009.

"Building on Kyoto: Towards a Realistic Global Climate Agreement," by Warwick J. McKibbin, Peter J. Wilcoxen, Energy Security Initiative Working Paper, November 2008.

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