

Economics and Climate Change: Cap and Trade

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Climate change is perhaps the most important but disregarded problem we have in today's world. To combat it, we need to decrease our level of carbon emissions. To achieve this, we have different policy alternatives. In trying to reduce the carbon emission up to a certain level, two methods deliver a result in which carbon emissions can be reduced with the lowest cost possible: carbon taxation and cap and trade. Both methods have their ups and downs. In this article, I will try to evaluate the shortcomings and benefits of these two different methods to articulate which one delivers a more efficient outcome.

The first option we have, carbon taxation, relies on determining the price of carbon emissions. We simply say that the firms need to pay a determined amount of money per each unit of their emission. The second option, cap and trade, limit the quantity of carbon emissions. This method uses tradeable carbon permits, there is a limited number of permits for carbon emissions and firms are able to trade these permits between each other, meaning the firms with higher abatement costs get more permits.

In a world where we could exactly measure the total cost of climate change and observe the cost curves of firms for their carbon abatement work, the two solutions would deliver the same result. We would be able to know, by observing the cost curves of firms, how much carbon they would be willing to abate at a given price. The rest would be easy, we know the optimal equilibrium point in the firms' cost curve so we would either set a quantity that gives a certain price, or set a price that delivers our optimal quantity.

However, things are not this simple in reality. We can not measure the exact "cost of abatement" curves of all the firms in total, so we can not know neither how much quantity of carbon will be abated at a certain level of taxation, nor what the price will be at a given quantity. We have to decide which uncertainty is better: an uncertainty in prices or quantity of carbon emission?

The argument in favor of carbon taxation states that since the primary cause of climate change is the stock of greenhouse gases in the atmosphere, one more unit of carbon emission does not affect much as we already have a lot of them in the atmosphere. This also states we have to make a big amount of change in the quantity of the greenhouse gases emitted to have a marginal benefit to the environment. This view clearly makes some deviations in the estimated quantity of greenhouse gases acceptable, since one more unit will not make a big change for the environment. Besides, they state that a

price for carbon emissions that is foreseeable in the future makes the investors more confident in their plans to invest in green energy.

The case for cap and trade opposes the idea that one more unit of carbon emission will not change much. It says we can not be sure that the relationship between the carbon emissions and world temperature is linear. According to this view, there might be an exponential relationship between the two, meaning that one more unit of carbon emissions will start to mean way more after a certain level, even causing irreversible damages to the earth. This kind of approach clearly comes to the conclusion that we should limit the quantity of carbon emissions to a certain level and we are not in a position to take the risk of disruptions in estimated quantities for a certain price level. Their case is that we should limit the amount of carbon emissions to a certain level even if it is at the expense of more price stability.

The answer to the question of which one should we choose depends on two things: what the natural sciences have to tell us economists about the nature of climate change and the normative question of what you think you should prioritize.

I believe I am not in the right position to explain the scientific knowledge upon the nature of climate change as an economics student, thus I will be focusing on the normative question. I believe the cap and trade method is more efficient precisely because of the uncertainty we face. I believe we do not have the luxury to permit some more greenhouse gases as the possible consequences of this include *irreversible* damage to the world. We do not have the chance of taking some risks to see if there is a linear or exponential relationship between greenhouse gases and the world temperature because every single individual in the world is affected by the dire consequences of climate change. We might be causing uncertainty in prices, but the long-term risks this has is way much lower than the long-term risks of more carbon emissions.

References:

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